FOOD INSECURITY, HEALTHCARE, AND MENTAL HEALTH SERVICES: EXAMINING RACE/ETHNICITY AS A MODERATING VARIABLE

by

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B.Sc. Biology-Psychology, (Hons.) Psychology, (*University of New Brunswick*, 2021)

A Thesis Submitted in Partial Fulfillment
of the Requirements for the Degree of

Master of Arts

in the Graduate Academic Unit of Psychology

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This thesis is accepted by the
Dean of Graduate Studies

THE UNIVERSITY OF NEW BRUNSWICK

June 2022

Abstract

Food insecurity (FI), a social determinant of physical and mental health, is a public health problem. Therefore, it is unsurprising that people who are food insecure report differences in their use of, and access to, medical and mental health services. Similarly, race/ethnicity is a social determinant of health, and people who are non-White generally reported differences in service use/accessibility compared to their White counterparts. Despite these interrelationships between FI, race/ethnicity, and healthcare outcomes, no study in the Canadian literature has investigated race/ethnicity as a moderator of FI-healthcare associations. The current study addressed this gap using data from the 2015-2016 Canadian Community Health Survey. As exploratory analyses, two methods of modelling food security (FS) status were compared. Results indicated that: 1) Race/ethnicity rarely moderated FI-healthcare associations, and, 2) Interpretations of relationships at times differed based on the method of modelling FS status. Findings have implications for healthcare and poverty-related policies.

Keywords: food insecurity, healthcare, mental health services, race, ethnicity, syndemic theory

Acknowledgements

First and foremost, I would like to extend my sincerest gratitude to my supervisor, Dr. David Speed. Thank you for your support, for your mentorship, and for every opportunity that you have provided me, all of which have enriched my educational experience and have made me a better researcher. I look forward to continuing to work with you and to learn from you. I would like to express a heartfelt thank you to my examining board, Dr. Enrico DiTommaso, Dr. Lisa Best, and Dr. Julia Woodhall-Melnik. I appreciate the time you all dedicated to this work, as well as the insightful feedback that you provided. I would also like to extend my gratitude to Dr. Moira Law for her edits on my research proposal, as well as to the staff of the Research Data Centre at UNB Saint John for their professionalism and dedication to my research project.

I would not be writing this Acknowledgement section if it were not for the unwavering support of my loved ones. To my amazing mother, Carla, thank you for continuously being my biggest supporter and for always believing in me. To the rest of my wonderful family, including my brother, Evan, my father, Collin, my stepfather, Jamie, my sister-in-law, Robyne, my aunt, Lori, and my grandparents, Carl and Valerie, thank you all for at least pretending to be interested whenever I talk about my research. To my partner, Brad, thank you for the encouragement, patience, and comfort that you have provided me with throughout this process. To my friends Bree and Sara, thank you for your constant encouragement, especially on the days when I needed it most. Finally, I would like to acknowledge my nephews, Spencer and Emmett: though neither of you are old enough to even know what a thesis is, you have been one of my biggest sources of inspiration throughout this process. Thank you.

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List of Abbreviations

95% CI – 95% Confidence Intervals

APA – American Psychological Association

BMI – Body Mass Index

CCHS – Canadian Community Health Survey

ER – Emergency Room

FAO – Food and Agriculture Organization

FI – Food Insecurity

FS – Food Security

GP – General Practitioner

IRR – Incidence Rate Ratio

OR – Odds Ratio

PTSD – Posttraumatic Stress Disorder

PUMF – Public Use Microdata File

RDC – Research Data Centre

U.S. – United States

WHO – World Health Organization

Food Insecurity, Healthcare, and Mental Health Services: Examining Race/Ethnicity as a Moderating Variable

The World Health Organization (WHO) defines health as a state beyond the absence of disease or infirmity that encompasses all dimensions of well-being, including both physical and mental wellness (WHO, 2006). A growing body of literature links physical and mental health to a wealth of social factors, referred to as the social determinants of health (Taylor et al., 2016). These are the conditions in which individuals are born and in which they age, as well as the forces and systems that shape the conditions of their daily lives (WHO, n.d.). Although these conditions, forces, and systems are non-medical in nature, they have significant influence on health (WHO, n.d.), as observed especially among those who experience unfair or unjust distribution of opportunity (Shim & Compton, 2020). Given their potential implications for overall well-being, it is of the upmost importance to understand the role that each of the social determinants of health play in influencing physical and mental wellness; however, two of these social determinants, food insecurity and racism/discrimination, are frequently overlooked (Shim & Compton, 2020), and are studied in isolation (Singer, 1994, Singer et al., 2006). Therefore, their joint impact on health has not yet been elucidated.

Food Insecurity

Food insecurity (FI) is the inadequate or restricted access to food due to limited monetary resources (Gundersen & Ziliak, 2015; Tarasuk & Mitchell, 2020). Prior to the 1970s, the term ‘food insecurity’ was generally used in reference to the food availability within a country: if this availability was not sufficient in meeting its citizens’ dietary energy requirements, then the country was considered food insecure (Pinstrup-Andersen, 2009). Recently, the term has developed a more individualistic meaning in developed countries, as it typically refers to *household* FI: whether a household has the needed resources for its members to acquire sufficient food for daily living (Pinstrup-Andersen, 2009). Further, although FI was initially considered a problem solely related to nutrition, it has become apparent that FI is an indicator of pervasive material deprivation (Tarasuk & Mitchell, 2020), suggesting that it extends beyond a measure of income or of poverty (Wight et al., 2014).

FI is relevant across the lifespan but is assessed differently in adult and child populations (Tarasuk & Mitchell, 2020); for example, the Canadian Community Health Survey (Statistics Canada 2019b, 2020) and the Household Food Security Survey Module (Government of Canada, 2020) have separate FI scales for child and adult respondents. Notably, the child scales are designed in such a way as to enquire about the general food security (FS) status of the household, whereas the adult scales—which will be used in the current study—are comprised of self-referencing questions pertaining to the respondent's personal FS status (Government of Canada, 2020; Statistics Canada, 2019b, 2020).

The Food and Agriculture Organization (FAO) of the United Nations states that FS status is not merely a binary state wherein an individual is secure or insecure, but instead recognizes that there are *various* levels of insecurity that a person can experience (FAO, n.d.). Additionally, the idea of a FS dichotomy has also been challenged by Hendriks (2015), who proposed a scale to capture the variability observed in FS status. The proposed continuum ranges from receiving adequate quality and a sustainable intake of food (being food *secure*), to experiencing starvation (the most severe form of FI; Hendriks, 2015). Moving along the scale towards starvation is associated with greater *insecurity*, with different possible levels of FI ("hidden" hunger, chronic hunger, and acute hunger; Hendriks, 2015).

Prevalence of Food Insecurity

It is estimated that 26.4% of the global population, or about 2 billion people, experience FI, with 9.2% reporting the most severe level of insecurity (FAO et al., 2019). Although FI disproportionately affects developing countries (FAO et al., 2019), it is also present in high-income nations such as Canada, the United States (U.S.), Australia, and the United Kingdom (Loopstra, 2018), highlighting relative income inequality in these countries. The most recent nation-wide assessment of FS status in Canada suggested that 12.7% of Canadian households experienced some degree of FI in the previous year (Tarasuk & Mitchell, 2020), with stark differences in FI prevalence observed between provinces and territories: Quebec reported the lowest rate of household FI at 11.1%, and Nunavut reported the highest rate at 57.0% (Tarasuk & Mitchell, 2020). This contrast is likely due, at least in part, to disparities in food accessibility or affordability in remote regions of Canada (Batal et al., 2021). Research in the past decade has shown similar rates of FI to what is observed in Canada in the populations of other high-income countries: approximately 10.5% of the U.S. population experiences FI (Coleman-Jensen et al., 2020), as does up to 13.0% of the Australian population (Bowden, 2020), and up to 10.0% of the population in the United Kingdom. (Sosenko et al., 2019). It is worth noting that these statistics were gauged prior to the onset of the COVID-19 pandemic, which has exacerbated FI on a global scale (Kent et al., 2020; Loopstra, 2020; Odunitan-Wayas et al., 2021; Polsky & Gilmour, 2020; Ziliak, 2020), due to its effects on food accessibility, food affordability, and job security (Clapp & Moseley, 2020). For the purposes of the current research and the archival data that were used for analyses, it is more accurate to use estimates compiled prior to the pandemic.

Predictors of Food Insecurity

Numerous predictors of FI have been identified in the international literature, including various household factors such as low household income, dependency on financial aid, living with children, and being a renter (Bartfeld & Wang, 2006; Domingo et al., 2021; Drakoulidou et al., 2020; Furness et al., 2004; Goldberg & Mawn, 2015; Leroux et al., 2018; Sriram & Tarasuk, 2016; Tarasuk et al., 2019; Walker et al., 2020). In Canada, the province or territory of residence is also predictive of FS status (Domingo et al., 2021; Leroux et al., 2018; Tarasuk et al., 2019), likely owing to differences in food accessibility or affordability in different regions (Batal et al., 2021), suggesting FI is better understood on a regional level rather than a national level. Several individual characteristics are also predictive of FI, such as lower educational attainment, being a young adult, being female, being single, and identifying as non-White (Bartfeld & Wang, 2006; Domingo et al., 2021; Drakoulidou et al., 2020; Leroux et al., 2018; Gebrie, 2021; Goldberg & Mawn, 2015; Jomaa et al., 2020; Sriram & Tarasuk, 2016; Tarasuk et al., 2019; Walker et al., 2020).

Race and Ethnicity

The American Psychological Association (APA) defines race as a social construct by which people of perceived physical similarity are categorized as a distinct group (APA, 2019). This categorization is based on traits such as skin colour, facial features, and hair texture (Barnshaw, 2008). Although this idea is now considered unfounded, in the past, it was accepted that there were biological differences between racial groups

(Smedley & Smedley, 2005). This is because historically (and even in present day), some researchers have erroneously used the term ‘race’ when referring to geographic ancestry or local populations, with this misuse most often observed when discussing genetic similarities between individuals within a racial group (Goodman, 2020; Yudell et al., 2016). Geographic ancestry is the relationship that an individual has with other persons within their genealogical history, creating indirect relationships between this individual and the members of the local populations to which their ancestors belonged (Goodman, 2020; Yudell et al., 2016). There *is* an evolutionary basis to geographic ancestry, although it has been questioned whether the same can be said about race, and thus it is not considered appropriate to consider differences related to geographic ancestry as being synonymous to racial differences (Goodman, 2020; Yudell et al., 2016), given that racial categorizations do not accurately represent human phenotypic variation (Barnshaw, 2008; Fuentes et al., 2019). Race, as a Western concept, is a hierarchy that has primarily emerged through European colonialism, oppression, and discrimination (Fuentes et al., 2019). This hierarchy still holds significant influence in present day, as it affects how an individual is treated, their life opportunities, and the quality of care that they receive (Smedley & Smedley, 2005).

Ethnicity is also the result of a social process, although not quite in the same way as race (APA, 2019; Sekulić, 2008). Ethnicity is defined as a grouping of people based on shared culture, which is related to a shared history or ancestry (APA, 2019). The formation of ethnic groups has involved people creating boundaries around themselves based on ancestry, culture, language, and oftentimes religion (Sekulić, 2008). Therefore, one’s ethnicity is self-selected based on cultural similarity, focusing on meanings, values, and ways of living (Markus, 2008).

Although race and ethnicity are distinct constructs, they are frequently measured together (APA, 2019; Markus, 2008). Because of this common amalgamation, the APA (2019) has emphasized the importance of being specific when defining groups to avoid error. As an example, erroneously combining cultural (i.e., ethnic) characteristics with perceived physical (i.e., racial) characteristics is unfortunately common, which has resulted in the terms ‘Black’ and ‘African American’ often being used interchangeably, which ignores that not all people who are Black are from Africa (APA, 2019).

Classification of Racial/Ethnic Groups

Because of the subjectivity in defining a racial or ethnic group, and because the racial/ethnic make-up of a country can vary so substantially, there exists no universal standard that is used when designating these groups (Department of Economic and Social Affairs, 2017). Further complicating the classification process, due to changes in our understanding of the concept of race/ethnicity, changes in survey technology, and changes in immigrant demographics, how these groups are measured within a country can vary over time (Stevens et al., 2015). Given this variability, I will present classifications from a Canadian perspective.

In 1995, the Department of Justice released the Employment Equity Act which defined a *visible minority* as a person who is non-Caucasian, regardless of their place of birth, and also not a member of an Aboriginal group. Today, visible minorities are considered any person who is Black, South Asian, Chinese, Korean, Japanese, Southeast Asian, Filipino, Arab/West Asian, or Latin American/Pacific Islander (Stevens et al., 2015). The Employment Equity Act defined *Aboriginal People* as persons who are Indian, Inuit, or Métis (Department of Justice, 1995), though the term 'Indian' has since been replaced by the term 'First Nations' (First Nations and Indigenous Studies, 2009).

Given the history of oppression that is associated with the creation of racial groups and hierarchies, the APA (2020) has argued that the terms 'Caucasian,' and 'visible minorities' are outdated. More appropriate terms include 'White' or 'European,' as well as 'people of colour' or 'underrepresented groups' (APA, 2020). This language has been deemed appropriate via correspondence with Todd Ross, the Indigenous Advisor at UNB Saint John. Additionally, in the recommendation of T. Ross (personal communication, July 27 and July 29, 2021), the term BIPOC (Black, Indigenous, and People of Colour) is more appropriate than simply 'people of colour,' and so the former will be used herein. Additionally, T. Ross (personal communication, July 27 and July 29, 2021) suggested using "non-racialized versus racialized groups" as an effective line when comparing people who are White to a group comprised of multiple BIPOC identities. Therefore, despite the terms that may be used in the cited literature or by the Canadian government, this thesis will follow the most recent APA guidelines and the recommendations of T. Ross when discussing race/ethnicity.

Food Insecurity and Race/Ethnicity

Race/ethnicity is predictive of FS status (Goldberg & Mawn, 2015; Tarasuk et al., 2019), as being a member of a racialized group is associated with an elevated risk of FI (Gunter et al., 2017; Leroux et al., 2018; Loopstra et al., 2019; Schroeder et al., 2019; Shirreff et al., 2021). Additionally, experiencing racism or discrimination has also been linked to a greater risk of experiencing FI (Chisolm et al., 2021; Logie et al., 2018). This link between FI and race/ethnicity has been examined in detail in numerous countries.

Findings from the Canadian literature suggest that individuals who are Black (Bhawra et al., 2021; Dhunna & Tarasuk, 2021; Logie et al., 2018) or Indigenous (Barreto et al., 2019; Bhawra et al., 2021; Rosol et al., 2011; Smylie et al., 2018; Tarasuk et al., 2019) are more vulnerable to experiencing FI. Indigenous communities report significantly higher rates of FI compared to the national average (Batal et al., 2021; Domingo et al., 2021; Richmond et al., 2020; Rosol et al., 2011), as observed in First Nations (First Nations Information Governance Centre, 2012), Inuit (Huet et al., 2017), and Métis (Rosol et al., 2011) communities. It is important to note that various factors likely influence these relationships. For example, both living on-reserve and living in remote regions are associated with greater FI; therefore, for Inuit and First Nations Peoples in particular, living on a reservation in the North is associated with an even greater risk of being food insecure (Batal et al., 2021; Rosol et al., 2011). Additionally, immigrants are more likely to experience FI than their Canadian-born counterparts (Davison & Gondara, 2021; Islam et al., 2014; Olabiyi & McIntyre, 2014), which is attributable to financial constraints, difficulties navigating food systems, and unequal job opportunities, among other things (Elshahat et al., 2021), suggesting immigrant status may play a role in the greater rates of FI observed in select racialized groups in Canada.

Evidently, a clear pattern has emerged from the Canadian literature with respect to FS status and race/ethnicity, with BIPOC identity being a predictor of FI (Bhawra et al., 2021). This trend has also been reported in other countries: for example, in the U.S., adults who identify as Black (Berkowitz et al., 2014; Denney et al., 2017; Laska et al., 2020; Long et al., 2020; Narain et al., 2018; Walker et al., 2020), African American (Brostow et al., 2019; Willis et al., 2020), Latinx (Denney et al., 2017), Hispanic (Berkowitz et al., 2014; Brostow et al., 2019; Laska et al., 2020; Long et al., 2020; Willis et al., 2020), Asian (Laska et al., 2020), or Indigenous (Laska et al., 2020; Willis et al., 2020) report greater rates of FI compared to adults who are White. In Australia (Foley et al., 2010) and Brazil (Soares et al., 2021), Indigenous Peoples are at greater risk for experiencing FI. Further, multi-country analyses have demonstrated that Black identity (Demétrio et al., 2020) and Indigenous status (Cormier et al., 2019) are linked to heightened vulnerability to FI. Taken together, the existing literature makes a strong case for an association between FS status and race/ethnicity, such that BIPOC identity is linked to a greater risk of being food insecure.

Food Insecurity and Health

Adults who are food insecure report poorer diet quality, primarily citing reduced intake of fruits and vegetables (Augusto et al., 2020; Gucciardi et al., 2009; Gulliford et al., 2003; Jomaa et al., 2020). These individuals report greater nutrient inadequacy than their food secure counterparts (Davison & Kaplan, 2015; Kirkpatrick & Tarasuk, 2008). Considering that poor nutrition is associated with poorer physical and mental well-being (Vozoris & Tarasuk, 2003), this could partially account for why FI is a social determinant of health (Horwitz et al., 2020; Tarasuk et al., 2015).

FI has been declared a public health issue in Canada, as it demonstrates a relatively high prevalence in the general population and is associated with various adverse health outcomes (Tarasuk & Mitchell, 2020). In both Canada and the U.S., FI has been linked to higher body mass index (BMI) and obesity (Domingo et al., 2021; Pruitt et al., 2016; Rasmusson et al., 2018; Smith & Coleman-Jensen, 2020), a puzzling finding given that the most extreme form of FI is starvation (Hendriks, 2015). There are several potential explanations for this paradoxical relationship: low-cost diets may be more calorie dense (Drewnowski & Darmon, 2005); food insecure individuals may have poor health literacy; and, fattening may be a physiological response to threatened food supply (Dhurandhar, 2016). Conversely, in Columbia and Trinidad, FI acts as a predictor of *underweight* status (Gulliford et al., 2003; Isanaka et al., 2007), and this difference may be linked to the prevalence and consumption of ultra-processed foods in Canada and the U.S. (Juul et al., 2018; Nardocci et al., 2021). Importantly, mild FI may not be visible within some groups of people, as malnutrition is less evident than emaciation.

People who are food insecure consistently report poorer health than their food secure counterparts (Billimek & Sorkin, 2012; Drakoulidou et al., 2020; Gucciardi et al., 2009; Pruitt et al., 2016; Ramsey et al., 2012; Schroeder et al., 2019; Smith & Coleman-Jensen, 2020; Vozoris & Tarasuk, 2003). Such individuals are more likely to report chronic health conditions (Tarasuk et al., 2013; Vozoris & Tarasuk, 2003): namely, FI has been linked to diabetes (Gucciardi et al., 2009; Pruitt et al., 2016; Seligman et al., 2007; Vozoris & Tarasuk, 2003; Weigel & Armijos, 2019), cardiovascular problems or diseases (Miguel et al., 2020; Smith & Coleman-Jensen, 2020; Sun et al., 2020; Vozoris & Tarasuk, 2003), and elevated risk of mortality (Gundersen et al., 2018; Sun et al., 2020).

FS status is not only a social determinant of physical health, as it is also a social determinant of mental health (Shim & Compton, 2020). Being food insecure is associated with poorer mental wellbeing (Elgar et al., 2021; Gucciardi et al., 2009; Jessiman-

Perreault & McIntyre, 2017; Jones, 2017; H. J. Kim & Kim, 2020), and has been linked to greater stress/distress and greater depression (Augusto et al., 2020; Billimek & Sorkin, 2012; Jessiman-Perreault & McIntyre, 2017; H. J. Kim & Kim, 2020; Pourmotabbed et al., 2020; Pruitt et al., 2016; Ramsey et al., 2012; Vozoris & Tarasuk, 2003). FI is also associated with an increased prevalence of psychopathology (McLaughlin et al., 2012), namely mood and anxiety disorders (Davison et al., 2018; Davison & Kaplan, 2015; Gucciardi et al., 2009; Hazzard et al., 2021; McLaughlin et al., 2012; Power et al., 2017; Tarasuk et al., 2013), and eating disorder pathologies (Hazzard et al., 2020, 2021; Power et al., 2017; Rasmusson et al., 2018).

Race/Ethnicity and Physical Health

In both Canada and the U.S., health outcomes are not comparable across racial/ethnic groups. Compared to people who are White, individuals who identify as Black (Kawachi et al., 1999; Lopez, 2004; Ramraj et al., 2016; Veenstra, 2009), Indigenous (Garrod et al., 2020; Singh et al., 2020; Veenstra, 2009, 2011; Vélez et al., 2020), Hispanic (Lopez, 2004; Ramraj et al., 2016), or Asian (Veenstra, 2009, 2011; Veenstra et al., 2020) report poorer health status, highlighting significant health disparities among racialized groups. Specifically, Indigenous Peoples are more vulnerable to developing diabetes (Jaffer et al., 2021; Martino et al., 2020; Matsumoto et al., 2020; Ramraj et al., 2016; Singh et al., 2020; Veenstra, 2009; Vélez et al., 2020), hypertension (Matsumoto et al., 2020; Ramraj et al., 2016; Smylie et al., 2018), and pulmonary diseases (Lyons et al., 2014; Ramraj et al., 2016; Smylie et al., 2018) when compared to Canadians who are White. Indigenous Peoples are also more likely to suffer premature mortality, with their reduced life expectancy frequently linked to infectious diseases (Lyons et al., 2014; Tjepkema et al., 2010; Trovato, 2001). Heightened vulnerability to diabetes and hypertension is also observed in Canadians who are Asian or who are Black (Veenstra, 2009, 2019; Veenstra & Patterson, 2016; Veenstra et al., 2020). In summary, racialized groups are more likely to report poorer health status compared to their non-racialized counterparts.

There are various potential explanations to account for racial/ethnic disparities in health. One theory focuses on the interrelationships between race/ethnicity, SES, and health (National Research Council, 2004). BIPOC identity is predictive of lower SES, which, in turn, is associated with poorer health; therefore, by extension, identifying as BIPOC is associated with poorer health (Williams, 1996). Even at higher levels of SES, health disparities are still present, which may be due to lower salary or poorer workplace conditions for the same or similar jobs when they are performed by racialized versus non-racialized groups (Williams et al., 2010).

Another theory to explain racial/ethnic health disparities focuses on other social determinants of health such as racism, discrimination, and stress (National Research Council, 2004). Racism and discrimination indirectly affect one's health by restricting socioeconomic opportunities and residential mobility (Williams, 1999). Experiencing discrimination is also associated with reduced trust of healthcare workers/systems, lower quality of care, and lower satisfaction with care (Williams et al., 2019). Additionally, experiencing racism in healthcare settings is linked to delayed help-seeking behaviours and reduced odds of adhering to medical recommendations (Williams et al., 2019). Racism and discrimination are also directly linked to health status via stress, as experiencing racial/ethnic biases is associated with alterations in physiological processes which can negatively impact health (Williams et al., 1997): greater exposure to such stress over time may therefore increase one's risk of morbidity and mortality (National Research Council, 2004). To be clear, *multiple* theoretical rationales most likely account for the observed relationship: all these causes and paths likely work in tandem to contribute to the association between race/ethnicity and health (William et al., 2019).

Race/Ethnicity and Mental Health

Findings from both the Canadian and American literature suggest that being a member of a racialized group is associated with poorer self-rated mental health, as observed in individuals who are Asian (Chiu et al., 2018; Lim et al., 2019; Sorkin et al., 2009; Veenstra et al., 2020), Black (Veenstra, 2019), African American (Sorkin et al., 2009), or Hispanic (Lim et al., 2019). Incongruously, *non*-racialized Canadians report a *greater* incidence of suicidal ideation (Chiu et al., 2018; Clarke et al., 2008) and of mental illnesses, including mood disorders, anxiety disorders, and substance use disorders (Breslau et al., 2006; Chiu et al., 2018; Erving et al., 2019; Singh et al., 2020).

The lower prevalence of psychopathology observed in racialized groups does *not* extend to Indigenous populations: Indigenous Peoples report a higher prevalence of posttraumatic stress disorder (PTSD; American Psychiatric Association, 2017; Bingham et al., 2019; Kisely et al., 2017), greater depressive symptoms (Hop Wo et al., 2020; Wu et al., 2003), and elevated risk of suicidality (Clarke et al., 2008; Hop Wo et al., 2020), highlighting a significantly greater disadvantage within this population. The Canadian literature points to the effects of residential schools as serving a large role in this greater incidence of psychopathology, with the primary drivers identified as the cultural discontinuity due to forced assimilation, as well as the trauma of physical, emotional, and/or sexual abuse that was carried out at these institutions (Kirmayer et al., 2000). Trauma can lead to abnormal brain functioning at the genetic level such that the effects of trauma are heritable, meaning that susceptibility to mental illness can likely be passed from residential school survivors to subsequent generations (González-Pardo & Álvarez, 2013; Masterpasqua, 2009; Ramo-Fernández et al., 2015). Trauma can also be transmitted to subsequent generations via non-biological pathways, such as through primary socializations with parents and other caregivers (Kellermann, 2001).

Evidently, paradoxical relationships have emerged in both Canada and the U.S. such that racialized identity (excluding Indigenous identity) is associated with poorer self-reported mental health, yet lower rates of mental disorders (Kisely et al., 2017; Lim et al., 2019). One potential explanation for this discrepancy is illness severity: although individuals of racialized groups are less likely to be diagnosed with a psychological illness, they are more likely to be persistently ill (Breslau et al., 2005; Sentell et al., 2013), reporting longer lasting effects of mental illnesses (American Psychiatric Association, 2017). This may account for the greater burden of disability due to psychopathology observed among racialized groups, despite lower illness rates (American Psychiatric Association, 2017).

Alternatively, given the cultural insensitivity of commonly used assessment instruments (Rogler, 1999), the lower prevalence of psychopathology among many racialized groups may be a flaw in assessment (American Psychiatric Association, 2017). Measures used in the diagnosis of mental illnesses are typically designed by Western individuals, for Western individuals, which produces a host of problems when they are administered to people or Peoples who are not of European descent due to language issues (e.g., loss of meaning in translation) and a lack of cross-cultural applicability (American Psychiatric Association, 2017; Rogler, 1999). Yet another potential reason for this paradoxical finding is that BIPOC populations face greater barriers to accessing mental healthcare, which include language barriers (American Psychiatric Association, 2017) and cultural insensitivity of professionals (Swartz et al., 1998; Woodward et al., 1992). Persons of racialized groups could therefore experience comparable or even increased rates of mental illness, but these disorders may go undiagnosed in these groups.

The Interplay Between Social Factors and Health

FS status and discrimination are appropriately classified as social determinants of health (Shim & Compton, 2020), given that both FI and race/ethnicity (which is intimately linked to discrimination; Fuentes et al., 2019) have been consistently linked to health outcomes (Ramraj et al., 2016; Tarasuk & Mitchell, 2020). Nevertheless, there exists a gap in our understanding as to the overall health implications due to the relation between these variables (Chisolm et al., 2021; Tarasuk et al., 2019). To further complicate this issue, despite this awareness of the influence of social factors on health, psychosocial conditions are often conceptualized as distinct entities acting independently of their social contexts (Singer, 1994, Singer et al., 2006), and so we do not have a clear understanding as to the effects of these conditions in a multi-faceted system. This notion that psychosocial conditions are isolated problems is challenged by syndemic theory, first proposed by Singer (1994), which adopts a holistic view of physical and mental health. The theory was initially proposed to explain the syndemic—or the clustering of social and health problems at the population level (Singer et al., 2017)—facing underprivileged Americans living in urban settings (Singer, 1994). According to syndemic theory, a disadvantaged social environment increases vulnerability to experiencing two (or more) problems or conditions related to physical, mental, or social health simultaneously, suggesting that such problems are more likely to cluster within a socially disadvantaged population (Singer et al., 2017). Driven by the relative social context, these problems or conditions produce a synergistic effect through biological, social, and psychological interactions that, in turn, increase the health burden of the affected population via a multiplicative effect (Singer et al., 2017). Thus, syndemic theory not only takes the social determinants of health into consideration, but also acknowledges that they can compound to exacerbate health problems (Singer et al., 2017). The theory therefore serves as a justification for examining ways that social inequality and social injustice contribute to the clustering of, and interactions between, conditions that thereby influence heightened vulnerabilities to health burdens among at-risk populations (Singer et al., 2017).

Since its conception, syndemic theory has been extended to various works within the field of psychology. This is seen with relationships between social factors and mental health conditions, such as the synergistic impact of being a sexual minority and experiencing negative social interactions (Barry et al., 2020). The theory has also been extended to various FI relationships: researchers have investigated the synergistic effects of being food insecure and experiencing diet-related chronic diseases (Himmelgreen et al., 2020), and of being food insecure and living with HIV/AIDS (Garcia et al., 2013; Logie et al., 2018; Workman & Ureksoy, 2017). Further, race/ethnicity has been examined as a driver of various syndemic vulnerabilities, such as susceptibility to HIV in men who are Black or Latino (Wilson et al., 2014), and vulnerability to psychosis in BIPOC groups (Coid et al., 2020).

If a population has syndemic vulnerabilities, they experience greater vulnerability to poor physical and/or mental health outcomes (Singer et al., 2017). One could expect that this would undoubtedly have an impact on the use of medical and/or mental health services by members of this population. Andersen and Newman (1973) proposed three factors that influence whether an individual will seek care, and one of these factors is illness severity. This means that an individual must perceive their illness as being ‘worthy’ of seeking care, which would be more likely to occur with an individual with poorer health (Andersen & Newman, 1973). Even so, another help-seeking factor proposed by Andersen and Newman (1973) is service accessibility: just because someone is likely to use services does not ensure that services are *available* to them. Therefore, if the social factors implicated in a syndemic influenced a population’s relative *access* to care, one could also expect that experiencing such a syndemic would have implications for whether the members of the population were able to access supports, even if the severity of their illness warranted seeking care (Andersen & Newman, 1973).

Food Insecurity and Healthcare

Utilization of Medical Care Services

Healthcare encompasses medical services, preventive care, public health services, and select social support services that function to improve and maintain human health (Daniels, 1985). Three factors that are thought to influence utilization of such services are illness severity, service accessibility, and predisposing traits, the latter of which includes characteristics of the individual that are present prior to the onset of illness, such as age, health beliefs, and socioeconomic status (Andersen & Newman, 1973). Understanding the factors that influence whether an individual will seek care is important when trying to decipher trends in service utilization, especially if certain populations tend to use (or *not* use) specific types of services (Padgett & Brodsky, 1992).

The healthcare system in Canada uses a universal approach known as Canadian Medicare, designed to provide services based on need rather than patients' financial stability (Allin et al., 2020; Asada & Kephart, 2007). The Canada Health Act lists various criteria for the Canadian healthcare system: public administration, comprehensiveness, universality, portability, and accessibility of care (Asada & Kephart, 2007). Interestingly, although the relationship between FI and health service utilization has not been extensively investigated in Canada, Canadians who are food insecure show greater utilization of healthcare services, namely acute care, surgical care (Men et al., 2020), and hospital services (Gucciardi et al., 2009), relative to their food secure counterparts.

Findings from other countries support the association depicted between FI and healthcare utilization in the scant Canadian studies: overall, adults who are food insecure are more likely to use healthcare services than adults who are food secure (Bhargava & Lee, 2016; Ramsey et al., 2012). For example, this trend is observed in the U.S., where FI has been linked to greater use of primary care (Bhargava & Lee, 2016; Nelson et al., 2001), acute care (Weigel & Armijos, 2019), and emergency services (Baggett et al., 2011; Bhargava & Lee, 2016; Janio & Sorkin, 2021; Kushel et al., 2006; Schroeder et al., 2019), as well as greater odds of being hospitalized and a greater number of hospitalizations (Baggett et al., 2011; Bhargava & Lee, 2016; Jia et al., 2021; Kalichman et al., 2014; Kushel et al., 2006). Additionally, Americans who are food insecure report greater healthcare expenditures (Berkowitz et al., 2018; 2019; Dean et al., 2020; Johnson et al., 2021).

In comparison to the American literature, the relationship between FI and healthcare use has been understudied in the Canadian context. However, given the differences between the Canadian and American healthcare systems (Allin et al., 2020; Bozic, 2013), direct generalizations between these countries would not be appropriate. Therefore, further exploration of the association between FI and utilization of healthcare services within the Canadian population is required to determine whether the specific associations reported in the American literature are comparable to the relationships observed in Canada.

Barriers to Accessing Healthcare

Even though FI is associated with greater utilization of health services (Bhargava & Lee, 2016), a contradictory relationship between FI and *access* to care has emerged in the literature: being food insecure has been linked to facing greater barriers to accessing care (Gucciardi et al., 2009; Janio & Sorkin, 2021). Although the Canadian literature on this relationship is limited, results of extant studies suggest that Canadians who are food insecure are more likely to report unmet care needs (Gucciardi et al., 2009) and are more likely to be high-cost healthcare users (Fitzpatrick et al., 2015; Tarasuk et al., 2015), with the latter having been linked to hinderances in accessing primary or preventive care services. People experiencing FI are likely offsetting their reduced access to such care by using emergency services, which are more costly, at a greater rate than the average citizen (Fitzpatrick et al., 2015).

The link between FI and healthcare accessibility has received greater attention from American researchers. In the U.S., being food insecure is linked to facing greater barriers in accessing services (Janio & Sorkin, 2021; Kushel et al., 2006; Narain et al., 2018; Pruitt et al., 2016), greater financial barriers to care (Billimek & Sorkin, 2012), reduced medication adherence (Afulani et al., 2015; Herman et al., 2015; Kushel et al., 2006), greater odds of lacking a usual source of care (Jia et al., 2021), and greater odds of delaying prescriptions (Becerra et al., 2021). Evidently, the FI-healthcare barrier association has been studied more extensively in the U.S. and, therefore, additional research from the Canadian population is needed.

Researchers in the U.S. have postulated a potential explanation for this association between FI and poorer access to health services (Berkowitz et al., 2014; Kushel et al., 2006). This link may be the result of people who are food insecure often facing "treat or eat" choices: in situations in which health services pose significant financial expenses (e.g., when prescriptions are not fully covered by insurance), adults facing FI are confronted with competing demands on their limited resources (Berkowitz et al., 2014; Kushel et al., 2006). Such individuals must essentially choose between purchasing food (or paying for other important needs) and paying for needed medical care or other related expenses (e.g., childcare, paying for transportation; Berkowitz et al., 2014). It is posited that these individuals are more likely to perceive their need for food (or some other resource) as being of greater concern than their health needs (Kushel et al., 2006).

Mental Health Services

Mental healthcare encompasses medications, therapy, and psychosocial services designed to promote mental wellness in individuals living with poor mental health or with psychological illnesses (National Alliance on Mental Illness, n.d.). Mental health professionals include social workers, psychologists, counsellors, clinicians, therapists, psychiatrists, psychiatric or mental health nurses, and even primary care physicians (National Alliance on Mental Illness, 2020). As with utilizing medical health services, people must perceive any mental health problems or illness as being sufficiently severe to warrant seeking care (Robertson & Mosher-Ashley, 2002). Additionally, although Canada operates via a universal healthcare system, mental health services are not covered by Canadian Medicare, aside from services provided by a general practitioner (GP), a psychiatrist, or community mental health centres, and so fees for mental healthcare must generally be paid out of pocket unless one has private insurance (Allin et al., 2020; Centre for Addiction and Mental Health, n.d.).

Notably, there is a literature gap on the association between FS status and mental health service use. The Canadian literature on this association is especially limited, although extant studies have linked FI to greater odds of visiting any professional about mental health (Lamont, 2021), greater use of emergency and non-emergency mental health services, and a greater number of visits to a psychiatrist (Tarasuk et al., 2018a). These associations are not surprising, given the association between FI and poorer self-reported mental health, and that FS status is considered a social determinant of mental health (Shim & Compton, 2020).

The FI-mental health service use association has been examined in *slightly* greater detail in the American literature, wherein FI has been linked to greater mental health service use (Burruss et al., 2021; Jia et al., 2021) and greater odds of psychiatric hospitalization (Baggett et al., 2011; Kalichman et al., 2014); however, the results of one study do suggest a *negative* association between FI and odds of service use (Afulani et al., 2020). To my knowledge, the only other study examining this association is from

Korea, where being food insecure has been linked to greater odds of visiting a mental health counsellor, thought to be driven by a greater prevalence of mental health problems among vulnerable populations (H. J. Kim & Kim, 2020), but this has unclear generalizability to Canadians. Therefore, although the limited available data suggests that there is a positive association between FI and mental health service use, it is apparent that more support for this claim is needed.

Race/Ethnicity and Healthcare

Race/ethnicity is another social factor to consider when examining service use and access to care. Like FS status, racial/ethnic identity has also been examined in the context of healthcare utilization, barriers to care, and mental healthcare utilization. Given the known association between FI and race/ethnicity (Tarasuk et al., 2019), it is important to elucidate similarities and differences in the associations that each demonstrates with these three general types of healthcare outcomes to gain a better understanding of the interrelationships between FI, race/ethnicity, and healthcare use/accessibility.

Healthcare Use

In Canada, racialized groups show different trends in the utilization of healthcare services than their non-racialized counterparts, owing to factors such as health professionals' attitudes toward racialized groups, language barriers, transportation barriers, and familiarity with the healthcare system (Quan et al., 2006). Canadians who identify as Black, Hispanic (Boudreaux et al., 2003), Chinese (Bainey et al., 2018), South Asian (Yarnell et al., 2020), or Indigenous (Barnabe et al., 2017; Campbell et al., 2012; Firestone et al., 2014; Lyons et al., 2014; Marrie et al., 2004) report greater use of emergency and hospital services than Canadians who are White. Additionally, Indigenous

Peoples are more likely to visit a nurse (McDonald & Trenholm, 2010) and to use other primary care services (Barnabe et al., 2017). Chinese Canadians (Yang et al., 2014) and Indigenous Peoples (Barnabe et al., 2017; Campbell et al., 2012; Heaman et al., 2005; Lyons et al., 2014; Vélez et al., 2020) are *less* likely to use specialized care services, and Chinese Canadians are less likely to visit a GP (Yang et al., 2014). Evidently, this is not a thorough examination into the help-seeking behaviours of all racial/ethnic groups, but it does begin to highlight key differences between racialized and non-racialized groups.

Racial/ethnic trends in healthcare utilization have also emerged in other countries: for example, in the U.S., Americans who are Black are more likely to use emergency and hospital services than Americans who are White (Bloom & Cohen, 2011; Gray et al., 2020; Hershman et al., 2020; Laditka & Laditka, 2006), whereas Asian Americans/Pacific Islanders (Gray et al., 2020; E. J. Kim et al., 2019; Tran et al., 2016) are comparatively *less* likely to use such services. Further, individuals who identify as Black (Kirby et al., 2006) or Asian American/Pacific Islander (E. J. Kim et al., 2019; Paek & Lim, 2012; Tran et al., 2016) are *less* likely to use ambulatory and primary care services than individuals who identify as White. It has also been reported that Americans who are Black are less likely to use specialized care services (Schultz et al., 2021). Additionally, in Italy, individuals of African or of Asian descent are less likely to access specialized care (D'Angelo et al., 2020).

In summary, racialized groups are generally less likely to use primary/preventive healthcare services and specialized services, and are generally more likely to use emergency services, compared to their non-racialized counterparts. These relationships have been observed in other countries with differing healthcare systems, and are at least partially attributable to greater barriers faced in accessing care for people identifying as BIPOC (Quan et al., 2006). Similarly to what was observed in the FI-healthcare use association, people facing greater disadvantage generally reports greater service use: here, BIPOC populations are more likely to use health services (Quan et al., 2006), and when examining FS status, people who are food insecure generally report greater use of care (Janio & Sorkin, 2021). Given these interrelationships, it is surprising that the FI-race/ethnicity association is largely ignored in studies examining racial/ethnic differences in healthcare utilization, where FS status (or a related marker of financial status) is often omitted as a control variable (e.g., D'Angelo et al., 2020).

Barriers to Care

Findings from the literature suggest that racialized groups face poorer access to healthcare services, posing a significant threat to the health of such groups, given that poor healthcare access is linked to poorer health (Butkus et al., 2020). Findings from the Canadian literature suggest that racialized groups may be less likely to have a primary care provider (Lebrun & Shi, 2011) and, in turn, face greater difficulty in accessing care and are also less likely to seek help for any issue that they do not deem to be sufficiently severe (Andersen & Newman, 1973). Additionally, people who are Black, people who are South Asian (Yeates et al., 2004; Zhang et al., 2019), and Indigenous Peoples (Tonelli et al., 2004; Yeates et al., 2004) report prolonged wait times to receiving needed surgeries and transplants in Canada. Indigenous Peoples are also less likely to have a primary care provider (Lafond et al., 2017), are more likely to cite discrimination by healthcare providers as a hinderance to accessing care (Kitching et al., 2020), and are more likely to report inadequate access to care (Garrod et al., 2020; Vélez et al., 2020).

The trend of poorer healthcare access among BIPOC populations has also been observed in other countries, such as the U.S.: for example, Americans of a racialized identity are less likely to have a usual source of care (Lebrun & Shi, 2011), and this has been observed specifically among people identifying as Black (Brewer et al., 2020; James et al., 2018; Kirby et al., 2006; Shi et al., 2014), Asian (James et al., 2018; Shi et al., 2014; Wen & Balluz, 2010), or Indigenous (James et al., 2018). Additionally, compared to their White counterparts, Americans who are Black are more likely to experience financial barriers to accessing care (Buchmueller & Levy, 2020; Gary et al., 2003) or to delay or not obtain needed care (Farias et al., 2020; Miller et al., 2014), and Americans who identify as Black (Brewer et al., 2020; Farias et al., 2020) or Indigenous (Martino et al., 2020) report longer wait times for needed care. These relationships are thought to be driven by various system-level factors such as lower quality of care for people who are BIPOC and communication barriers (Farias et al., 2020; Martino et al., 2020)

In summary, as reported in the literature from two different countries, racialized groups face poorer access to care. Thus, as with FS status, the group facing a greater disadvantage also reports reduced access to needed care. Further, there is again an ignorance as to the potential influence of the FI-race/ethnicity association in the examination of racial/ethnic differences in access to care (e.g., Garrod et al., 2020; James et al., 2018). Although Kitching and colleagues (2020) controlled for FS status in their examination of hinderances to care for Indigenous Peoples, treating FI solely as a covariate does not provide insight into how the relationship between race/ethnicity and barriers to care may vary across different levels of FS status.

Mental Healthcare

BIPOC populations face poorer access to mental health services, citing barriers such as insurance problems, stigma, lack of culturally competent care, language barriers, and distrust in the general healthcare system, all of which undoubtedly impact actual help-seeking behaviours (American Psychiatric Association, 2017). Findings from the Canadian literature suggest that adults who are Southeast Asian, Chinese, or Black are less likely to use mental health services compared to Canadians who are White (Anderson et al., 2017; Chiu et al., 2018; Tiwari & Wang, 2008); however, Rotenberg and colleagues (2017) reported that Canadians identifying as South Asian or Southeast Asian show greater *coercive* use of psychiatric emergency services, meaning that services were accessed due to involuntary detention, police referral, or ambulatory referral. Therefore, the association between race/ethnicity and mental health service use among Canadians is not entirely clear, although generally, racialized groups are less likely to seek (non-coercive) mental health care.

Racial/ethnic differences in mental health service utilization are studied more extensively outside of Canada. In the U.S., individuals who identify as Black (Cook et al., 2017; Hunt et al., 2015; Jackson et al., 2007), Hispanic (Cook et al., 2017; Hunt et al., 2015; Kimerling & Baumrind, 2005; Samnaliev et al., 2009; van der Ven et al., 2020), or Asian (Cook et al., 2017; Hunt et al., 2015; Kimerling & Baumrind, 2005; Sentell et al., 2013) report lesser use of mental health services. The American literature also presents evidence of poorer *access* to mental health services for BIPOC populations: this is observed in people identifying as African American, Hispanic American (Cook et al., 2017; Wells et al., 2001), Asian American, or Latinx American (Sorkin et al., 2009).

Additionally, adults who are African American (Alegría et al., 2008; Shao et al., 2016), Black (Fong et al., 2021; McGregor et al., 2020), Hispanic (McGregor et al., 2020), or Asian (Alegría et al., 2008; McGregor et al., 2020; Shao et al., 2016) are less likely to receive needed depression treatment. This association between racialized identity and poorer access to care could account for at least part of the association between racialized identity and lower use of mental health services.

Overall, BIPOC groups demonstrate lower rates of mental health service utilization, based on studies from both Canada and the U.S. Therefore, there is a divergence in the mental health service use trends reported between food insecure populations and BIPOC populations: with FS status, the group facing greater disadvantage (i.e., people who are food insecure) generally reports *greater* use of mental health services (Tarasuk et al., 2018a), whereas with race/ethnicity, groups facing greater disadvantage (i.e., BIPOC populations) report *less* service use (Cook et al., 2017). Considering the parity observed in the direction of medical service use/access reported thus far, this "discrepancy" is intriguing. Additionally, the potential influence of the FI-race/ethnicity association in the relationship between race/ethnicity and mental healthcare utilization is largely ignored in the current literature (e.g., Chiu et al., 2018; Fong et al., 2021), which is peculiar given the known interrelationships amongst these variables.

Summary of the Gaps in the Literature

To summarize, the literature has linked FI to greater healthcare use, greater odds of facing barriers to care, and greater mental health service use, although support for these associations is relatively scarce in the Canadian literature. Additionally, evidence suggests that BIPOC populations are more likely to use *emergency* health services, are less likely to use *primary* and *preventive* services, face greater barriers to care, and are less likely to use mental health services; but this not fully understood in a Canadian context. Further, despite the interrelationships between FS status, race/ethnicity, and medical/mental health service use/access, to date, no study in the Canadian literature has investigated race/ethnicity as a *moderator* of the FI-healthcare relationships. Therefore, it is implicitly assumed by the literature that the associations that FI has with the three general types of healthcare outcomes (healthcare use, barriers to care, and mental health service use), are experienced identically across racial/ethnic groups.

One study from the U.S. investigated racial/ethnic differences in the 'FI-medical healthcare use' relationship, examining differences between children who are White and children who are Black (O'Malley et al., 2017). Another study from the U.S. examined the role of FI in Black-White racial disparities in the utilization of health services among cancer survivors (Ojinnaka & Bruening, 2021). These two studies, however, are esoteric and the topics presented in these studies are not fully elucidated, and thus their findings have unclear generalizability to the Canadian population.

Theoretical Rationale

The question of whether race/ethnicity acts as a modifying variable in the associations between FI and healthcare outcomes is unanswered, but there is ample theoretical reason to suspect an overlooked interaction. One theory that serves to justify a moderation model is syndemic theory (Singer, 1994), which has yet to be extended to potential interactions between conditions related to FI and conditions related to being a member of an underrepresented racial/ethnic group. As being food insecure and being of a racialized identity are both associated with specific trends in physical and mental health outcomes, the framework of syndemic theory can be extended to the research question at hand. Within this framework, one could postulate that both being food insecure and that being a member of an underrepresented group would both be significant drivers of a disadvantaged social environment. Within this disadvantaged social context, the co-occurrence of the negative health effects that are associated with FI and the negative health conditions that are associated with being a member of an underrepresented group would interact via biological, psychological, and/or social pathways (Singer et al., 2017). Such interactions would worsen the health status of the afflicted population by exerting a significant and adverse impact on physical and mental health outcomes (Singer et al., 2017). Because of the synergistic interactions, a person who is both food insecure and BIPOC would face heightened vulnerabilities to poorer physical and mental health, compared to someone who is *either* (or neither) food insecure or BIPOC, owing to the multiplicative nature of the interactions between conditions (Singer et al., 2017). Because of these anticipated physical and/or mental health, different trends related to the utilization of medical and mental healthcare services could be anticipated in a person living in this disadvantaged social environment, as well as differences in service accessibility due to the relative social context, when compared to someone who is food secure and/or White.

Given that syndemic theory has already been extended to various relationships involving FI (e.g., Logie et al., 2018) and race/ethnicity (e.g., Coid et al., 2020), the application of this theory to the current study was justified. Additionally, BIPOC identity is predictive of FI (Tarasuk et al., 2019), and so it is likely for these two variables to “co-occur” in a given social environment. Therefore, in a population where individuals are at a greater risk of facing the social problems associated with FI, and simultaneously at a greater risk of facing the social problems associated with being part of an underrepresented group, it is likely that such a population would be vulnerable to experiencing a syndemic. This, in turn, would suggest that the multiplicative effect of a syndemic could be observed in the compounding effect of racialized identity in addition to experiencing FI, among other social determinants of health.

The Current Study

Although the associations between race/ethnicity and service outcomes have been studied in a general sense in the Canadian population, the associations between FI and service outcomes have largely been overlooked in the Canadian literature. Additionally, there has yet to be an investigation into whether racial/ethnic identity affects the FI-healthcare associations in a Canadian context. In other words, the existing literature assumes that the associations between FI and medical/mental health service use/accessibility are identical across all racial/ethnic groups. Given the relevant interrelationships involving FI, race/ethnicity, and service use/accessibility, this assumption is suspect.

Therefore, the primary goal of the current study was to investigate whether racial/ethnic identity acted as a moderator in the associations that FI exhibits with healthcare use, barriers to care, and mental health service use in the general Canadian population. The use of various types of medical and mental health services, and difficulties in accessing different types of care, were of interest, including previously examined variables to provide support for the existing literature, as well as novel outcomes yet to be examined in the context of FI and/or racial/ethnic disparities within the Canadian population. The current study focuses on identifying racial/ethnic disparities in use of and access to needed supports within an already-disadvantaged population (i.e., people who are food insecure).

Research Questions and Hypotheses

The current study sought to address nine research questions, categorized into three general themes: the associations between race/ethnicity and medical/mental health service use/accessibility, the associations between FI and service use/accessibility, and whether the link between FI and race/ethnicity influenced the associations between FI and service use/accessibility. These research questions are organized into three broad sections based on the type of healthcare outcome being examined in order to follow the progression of the analyses of interest: these sections are medical health service use, barriers to care, and mental health service use.

Healthcare Use. Research Question 1 focused on racial/ethnic differences in healthcare use, with the goal of examining a breadth of racial/ethnic identities. It was hypothesized that being a member of a racialized group would be associated with greater odds of using emergency healthcare services and decreased odds of using non-emergency care.

Research Question 2 examined the association between FS status and healthcare use. It was hypothesized that FI would be associated with a greater likelihood of using healthcare services.

Research Question 3 focused on racial/ethnic differences in the associations that FI demonstrates with healthcare use. The existing literature on this topic—specifically when applied to the theoretical framework of syndemic theory—would suggest that being a member of an underrepresented group would compound the relationship between FI and healthcare use. In other words, if the logic of syndemic theory extended to the relationships of interest, one would expect that the conditions related to being food insecure and the conditions related to being part of a racialized group would compound to exert a harsher effect on the outcome of interest. With that said, it was initially unclear what such a compounded effect would look like in the current study, as well as whether the effect would be comparable across underrepresented groups, given that this has yet to be examined in the Canadian literature. Thus, no formal hypothesis was formulated. Instead, a general research question was asked: Does race/ethnicity moderate the relationship between FI and healthcare use?

Barriers to Care. Research Question 4 focused on racial/ethnic disparities in access to needed care. It was hypothesized that being a member of a racialized group would be associated with greater odds of facing barriers to accessing care.

Research Question 5 examined the association between FS status and barriers to accessing needed care. It was hypothesized that FI would be associated with a greater likelihood of facing barriers to accessing care.

Research Question 6 focused on racial/ethnic differences in the associations that FI demonstrates with barriers to accessing care. As with Research Question 3, in considering the existing literature in tandem with syndemic theory, one could postulate that BIPOC identity would compound the relationship between FI and relative access to care; however, due to the novelty of this investigation, no formal hypothesis was formulated. Instead, I asked a general research question: Does race/ethnicity moderate the relationship between FI and barriers to care?

Mental Health Service Use. Research Question 7 focused on racial/ethnic differences in accessing mental health supports. It was hypothesized that being a member of a racialized group would be associated with decreased odds of using mental health services.

Research Question 8 examined the association between FS status and accessing mental health supports. It was hypothesized that FI would be associated with a greater likelihood of using mental health services.

Research Question 9 focused on racial/ethnic differences in the associations that FI demonstrates with mental health service use. As with Research Question 3 and Research Question 6, one could make predictions based on the existing literature and syndemic theory, but the research question itself is extremely novel, and so no formal hypothesis was formulated. Instead, a general research question was asked: Does race/ethnicity moderate the relationship between FI and mental health service use?

Exploratory Analyses

Given the argument to understand FS status beyond a binary state (i.e., food secure versus food insecure; Hendriks, 2015), and in the interest of retaining as much variability as possible in the FS status measure, I examined a continuous measure of FS status in the current study. I compared the continuous conceptualization of FS status to a binary measure to investigate what, if any, differences emerged. Therefore, the current study examined each research question using both a binary and continuous modelling of FS status.

Method

Participants and Data

All participants in the current study were respondents from the 2015-2016 cycle of the Canadian Community Health Survey (CCHS) – Annual Component. The CCHS is a cross-sectional survey designed to collect information on the health status, health determinants, and healthcare use of the general Canadian population by surveying a large, national sample of respondents (Statistics Canada, 2017b). The CCHS was developed in 1999 as a collaborative project between the Canadian Institute of Health Information, Health Canada, and Statistics Canada to address issues within the Canadian health information system (Statistics Canada, 2017b). The first cycle of the survey was conducted in the year 2000 (Statistics Canada, 2017b). Since its implementation, various modifications have been made, most notably a significant redesign in 2015 that produced a variety of changes: 70% of the survey questions were altered to some degree, new variable naming conventions were applied, the time periods throughout which data were collected were changed (from six two-month periods to four three-month periods), and data were only collected from half of the health regions in the North each year (Statistics Canada, 2017b).

The CCHS collects data from persons 12 years of age or older living in private dwellings across Canada (Statistics Canada, 2017b). The survey is designed to be representative of almost 98% of the Canadian population aged 12 or older: excluded from the coverage of this survey are individuals living on reserves and other Aboriginal settlements, full-time members of the Canadian Forces, adolescents living in foster homes, individuals living in institutions, and citizens of the Quebec health regions Région du Nunavik and Région des Terres-Cries-de-la-Baie-James (Statistics Canada, 2017b).

The CCHS is made up of four components (Statistics Canada, 2017a). *Core content* includes questions asked to all respondents, and these questions are retained throughout each CCHS cycle (Statistics Canada, 2017a). *Theme content* includes questions that are asked to all respondents of a specific cycle, but this content alternates between cycles (Statistics Canada, 2017a). *Optional content* includes questions that, to the discretion of the provincial/territorial stakeholders, can be excluded when delivered within specific health regions (Statistics Canada, 2017a). Finally, *rapid response models* include cost-recovery projects that are included in the cycle for one data collection period for provincial respondents (Statistics Canada, 2017a). An interview using the full-length survey takes 40 to 45 minutes to complete (Statistics Canada, 2017b).

Given the budget for the 2015-2016 CCHS, and in the interest of obtaining reliable estimates, it was predetermined that this cycle should obtain a sample of about 130,000 respondents, of which 120,000 should be adult respondents (Statistics Canada, 2017b). The sample allocation strategy for this cycle outlined that the minimum sample size per health region should be 500 respondents, with a maximum sampling fraction of 1 out of 20 dwellings (Statistics Canada, 2017b). The adult sample for the survey was obtained via a two-stage stratified cluster design: first, strata were formed, and independent clusters were drawn from each stratum; second, lists of dwellings were derived from each cluster, from which households were selected (Statistics Canada, 2017b). Using this design, 185,176 households were selected, and 110,095 people agreed to participate in the survey, generating a response rate of 59.5% for the two-year cycle

(Statistics Canada, 2017b). Data were collected between January of 2015 and December of 2016 (Statistics Canada, 2017b). Data collection occurred using two types of computer-assisted interviewing, one of which involved telephone interviews and the other involving personal interviews (Statistics Canada, 2017b). About 80% of the interviews were phone-based, while 20% were done in person (Statistics Canada, 2017b).

To be included in the sample for the current study, CCHS respondents must have satisfied several inclusion criteria. Respondents must have been 19 years of age or older to ensure that alcohol—which was a covariate—could be legally consumed by all respondents. CCHS respondents must have also provided responses to all questions related to the covariates, predictors, and at least one of the outcomes of interest. Given these restrictions, the largest sample size obtained in the current study was N = 8,680. Descriptive statistics for the largest sample (N = 59,630) are presented in Table 1, presented by racial/ethnic group. Please note that these values are purely descriptive, as it is prohibited to conduct bivariate comparisons with these data. Please also note that for reported sample sizes, the number of respondents has been randomly rounded up or down to a multiple of 10, in accordance with Statistics Canada guidelines.

Measures

Covariates

Numerous questions from the 2015-2016 CCHS are related to FS status, race/ethnicity, and health service use/accessibility, and thus the current study controlled for a variety of covariates (see Appendix A). This included respondent-related covariates such as age (measured continuously; minimum value = 19 years), sex (coded as 0 = female, 1 = male), educational attainment (less than high school = base category for comparison, high school graduate, or post-secondary certificate/diploma/degree), marital status (married or common-law = base, widowed/separated/divorced, or single), immigrant status (0 = non-immigrant, 1 = landed immigrant or non-permanent resident), dwelling ownership (0 = renter, 1 = owner), perceived physical health, which was rated on a 5-point scale from 1 (*poor*) to 5 (*excellent*), perceived mental health, which was rated on a 5-point scale from 1 (*poor*) to 5 (*excellent*), BMI (normal weight = base, underweight, overweight, or obese), smoking status (lifetime abstainer = base, current smoker, former smoker, or nonsmoker), alcohol use (did not drink in the previous year = base, occasional drinker, or regular drinker), and illicit drug use in the previous year, including one-time marijuana use (0 = no, 1 = yes; Statistics Canada, 2017a, 2019a, 2019b). Household-level covariates were also controlled for in the current study, such as region of dwelling (Atlantic provinces = base, Quebec, Prairies, British Columbia, or Territories excluding Yukon), number of children under the age of 18 living in the home (measured continuously), household size (measured continuously), and household income (measured continuously; Statistics Canada, 2017a, 2019a, 2019b). Please note that bivariate associations between individual covariates and the outcome variables were not examined, as this is against the release policies of Statistics Canada.

Predictor(s)

Although FS status is conceptualized as a continuum (FAO, n.d.; Hendriks, 2015), the adult FS measure from the 2015-2016 CCHS is a categorical variable derived from 10 questions that were adopted from Health Canada's model for FS status (see Appendix B; Statistics Canada, 2019b). Based on their scores on this scale, respondents are then classified into one of three possible categories: they can be either food secure (if they scored a 0 or a 1 on the scale), moderately food insecure (if their score fell within the range of 2-5), or severely food insecure (if their score fell within the range of 6-10; Statistics Canada, 2019b). A binary measure of FS status was computed by converting the score a respondent had on the FS status measure into a dichotomous variable. This was done by following the cut-offs used to create the three-group categorical measure of FS status in the CCHS (where respondents are categorized as food secure, moderately food insecure, or severely food insecure; Statistics Canada, 2019b), but by then combining the 'moderately food insecure' and 'severely food insecure' groups into an overarching 'food insecure' group. In following this method of classification, respondents who scored a 0 or 1 on the linear FS status scale were deemed 'food secure,' and those who received any score between 2 and 10 were deemed `food insecure.' This measure was found to be reliable ($\alpha = .94$).

As part of my exploratory analyses, I was interested in using a measure of FS status that retained as much variability as possible in my predictor variable. For this measure, instead of converting responses to a dichotomous variable, the 11-point scale was simply retained. The minimum score that a respondent could receive on this measure was 0, and the maximum score was 10, with higher scores indicating greater FI. This new variable therefore resembled and was interpretable in a similar fashion to the Household Food Insecurity Access Scale (Coates et al., 2007), and was found to be reliable ($\alpha = .94$).

Moderator

Although the publicly released 2015-2016 CCHS data contains only White or non-White as race/ethnicity categories (Statistics Canada, 2017b), the master file of the survey captures a breadth of cultural identities. To investigate the role of race/ethnicity in the FI-healthcare relationships, two variables were combined to be examined as a single moderator in the current study (see Appendix C). One variable captured the cultural/racial background of the respondent, and the other was an identifier for Aboriginal status (Statistics Canada, 2017a, 2019a). Combining these two variables produces the following categories: White, Indigenous (First Nations, Métis, or Inuk/Inuit), South Asian, Chinese, Black, Filipino, Latin American, Arab, Southeast Asian, West Asian, Korean, Japanese, or 'other' (Statistics Canada, 2017a, 2019a); however, due to issues related to data sparsity, several categories had to be combined for the current study. This resulted in a total of seven racial/ethnic groups being examined (White = base, Indigenous, Asian, Black, Latinx, Arab, or 'Other'). Using these categories, I built two sets of interaction terms; the first of these sets examined race/ethnicity multiplied by the binary measure of FS status, and the second of these sets examined race/ethnicity multiplied by the linear measure of FS status.

Outcomes

Healthcare Use. The utilization of medical care by CCHS respondents was measured using six questions about self-reported healthcare use in the previous year (see Appendix D). Variables were selected in part to capture both emergency and non-emergency service use, given that reports from the literature suggest differing trends amongst racial/ethnic groups in the utilization in these types of services (Barnabe et al., 2017; Yang et al., 2014). The outcomes selected for analysis included whether the respondent had been hospitalized overnight beyond visits to the emergency room (ER; 0 = no, 1 = yes), the number of times the respondent was hospitalized overnight (measured continuously), the number of times the respondent visited the ER (measured continuously), the number of consultations with a family doctor or GP (measured continuously), the number of visits to a medical specialist (i.e., a surgeon, allergist, orthopedist, or psychiatrist; measured continuously), and the number of visits to a nurse (measured continuously; Statistics Canada, 2019a).

Although *odds* of hospitalization overlaps with the *number* of hospitalizations, there was interest in examining both outcomes independently in the current study. Both the likelihood of being hospitalized as well as the number of hospitalizations have been examined in the FI literature (Baggett et al., 2011; Bhargava & Lee, 2016; Jia et al., 2021; Kalichman et al., 2014; Kushel et al., 2006). Therefore, although data reduction could influence the risk of Type I error by reducing the number of analyses being performed, there was interest in providing support for these separate research ventures.

Barriers to Care. Respondents' access to healthcare services was assessed using six questions inquiring about self-reported barriers to accessing care in the previous year (see Appendix E). Outcomes were selected based on previous findings from the literature, as well as to examine novel associations related to healthcare barriers. Such outcomes included whether a respondent had a usual source of care for minor health problems (0 = no, 1 = yes), whether they had a regular care provider (0 = no, 1 = yes), whether they experienced a problematic wait time for their last medical appointment (0 = no, 1 = yes), whether they had to wait a week or more for care for a minor health problem (0 = less than 1 week, 1 = 1 week or more), whether they had to wait a week or more to see a health professional for a consultation (0 = less than 1 week, 1 = 1 week or more), and whether they had to skip prescription refills or doses due to cost (0 = no, 1 = yes, Statistics Canada, 2019a).

Mental Health Service Use. Respondents' use of mental health services was measured using six questions regarding self-reported use in the previous year (see Appendix F). Again, outcomes were selected to provide support for the existing literature, as well as to examine novel associations. Measures for mental health service use included whether the respondent had visited any professional about their emotional or mental health (0 = no, 1 = yes), whether they had visited a family doctor or GP about their emotional or mental health (0 = no, 1 = yes), whether they had visited a psychiatrist (0 = no, 1 = yes), whether they had visited a psychologist (0 = no, 1 = yes), whether they had visited a social worker or counsellor (0 = no, 1 = yes), and the number of times they visited a mental health professional (measured continuously; Statistics Canada, 2019a).

Procedure

For each CCHS cycle, two types of files are released: a master file, accessible only to researchers with security clearance through Statistics Canada, and a public use microdata file (PUMF), a derivative of the master file that is accessible to researchers via institutional libraries (Statistics Canada, 2017b). Variables that are most likely to contain identifying information are either removed from the PUMF or their responses are amalgamated into broader categories (Statistics Canada, 2017b), which occurred with the variable denoting racial/cultural identities in the PUMF for the 2015-2016 cycle. Given the importance of race/ethnicity to the current study, access to the 2015-2016 master file was requested, as this file contains all variables and records from the survey (Statistics Canada, 2017b). To gain access to this file, I had to apply to become a deemed employee of Statistics Canada to gain security clearance to a secure research data centre (RDC) where all analyses were conducted (Statistics Canada, 2017b).

Data Analysis

Analytic Framework

As the main goal of the current study was to investigate how race/ethnicity affects the direction or strength of the FI-healthcare relationships, the central analysis was statistical moderation (Baron & Kenny, 1986). The conceptual framework of moderation is that the relationship between a predictor and an outcome involves three potential paths: Path *a*, which is the impact of the *predictor* on the outcome; Path *b*, the impact of the *moderator* on the outcome; and Path *c*, the impact of the *interaction* between the predictor and moderator on the outcome (Baron & Kenny, 1986). Path *c* is, in essence, a test of syndemic theory: it is *literally* testing whether FS status and race/ethnicity exert a multiplicative effect (i.e., FS*race/ethnicity).

Analytical Approach

All statistical analyses were conducted at the local RDC using Stata version 15 software. To examine the role of race/ethnicity in the FI-healthcare associations, various hierarchical logistic regressions (for binary outcomes) and hierarchical Poisson regressions (for count outcomes) were carried out with weighted variables. Poisson regression was selected because FS status does not follow a normal distribution, as a greater proportion of people are food secure than are food insecure (FAO et al., 2019), and because the effects associated with FI tend to increase exponentially as the level of insecurity increases (Ames et al., 2016).

The RDC file contained both person-level weights, which allow for corrected point estimates, and bootstrap weights, which allow for corrected variance estimates. Unfortunately, bootstrap weights could not be applied in the current study due to data sparsity, and so error estimates were likely inflated. Additionally, although my sample sizes were large, some models were hampered by data sparsity.

Given the number of analyses of interest, results were evaluated using an $\alpha = .01$ to reduce the risk of Type I error. Regression results are presented as odds ratios (ORs) or as incidence rate ratios (IRRs) to also provide metrics of effect size. Please note that for ORs, 1.44 (or 0.70 for a negative association) is the cutoff for a small effect, 2.48 (or 0.40) is the cutoff for a medium effect, and 4.27 (or 0.23) is the cutoff for a large effect (Cohen, 1988). As there are no recommended guidelines for interpreting effect size from IRRs, I will use the same cutoffs as used for ORs.

To examine whether racial/ethnic identity moderated the associations between FS status and healthcare use, barriers to care, and mental health service use, all models were designed such that FS status was the predictor, race/ethnicity was the moderator, and a service use/accessibility measure was the outcome. As I was interested in comparing the two different methods of modelling FS status for my exploratory analyses, there were two unique models created for each of the 18 healthcare outcomes: one with binary FS status as the predictor, and the other with linear FS status as the predictor. The progression of all models followed the same general form:

Block 1: Covariates were entered into the model.

Block 2: Race/ethnicity was entered into the model.

Block 3: The binary measure of FS status was entered into the model.

Block 4: The interaction terms for binary FS status-race/ethnicity were entered into the model.

At this juncture, the analysis using binary FS status was complete. Given that the execution of Block 1 (covariates entered) and Block 2 (race/ethnicity entered) would be identical for a given outcome variable no matter which measure of FS status was used (since FS status was not introduced until Block 3), the model was functionally 'reset' to Block 2. In other words, all variables inputted in Block 3 (binary measure of FS status) and Block 4 (interaction terms) were removed, so that only covariates and race/ethnicity were entered in the model.

Block 5: The continuous measure of FS status was entered into the model.

Block 6: The interaction terms for continuous FS status-race/ethnicity were entered into the model.

Block 5 becomes a repetition of Block 3 (i.e., a measure of FS status is entered), and Block 6 is a repetition of Block 4 (i.e., interaction terms between race/ethnicity and FS status are entered), though the unique enumeration is used to avoid confusion. The presence of statistically significant interaction terms in Block 4 (for binary FS status) or Block 6 (linear FS status) would indicate a moderated effect but would not describe the *magnitude* of the effect. To examine differences in the predicted probabilities of the outcome variables across racialized and non-racialized groups, marginal means estimations were employed as follow-up analyses to significant interactions.

Results

Given the heterogeneity observed in the 'Other' group, the results for this group will not be discussed. Interested readers can refer to the relevant tables to inform themselves of such results.

Data Analytic Strategy

Following the execution of each of the hierarchical regression models, all models with at least one statistically significant interaction term were depicted via marginal means estimates in graphs. For these models that used binary FS status as the predictor, post-hoc pairwise comparisons were performed to examine between-group differences within the food secure group and the food insecure group. Please note that pairwise comparisons for the linear FS measure could not be released due to cell count guidelines provided by Statistics Canada.

For brevity, a general overview of the results will be presented in-text. Frequent reference will be made to enumerated tables and figures to better inform readers of the results. Results for Block 1 were omitted from all tables due to page constraints.

Healthcare Use: Research Questions 1, 2, and 3

Research Question 1 focused on racial/ethnic differences in healthcare use: it was hypothesized that being a member of a racialized group would be associated with greater odds of accessing emergency care, and decreased odds of using non-emergency care. Research Question 2 examined the FS status-healthcare use association: it was hypothesized that FI would be associated with a greater likelihood of using healthcare services. Research Question 3 explored whether race/ethnicity moderated the relationship between FI and healthcare use: no formal hypothesis was generated.

Having Been Hospitalized Overnight

Overnight hospitalization (excluding time spent in the emergency department) was regressed onto covariates in Block 1, $F(25) = 35.65$, $p < .001$. In Block 2, race/ethnicity was entered into the model with 'White' as the omitted group, $F(6) = 2.05$, $p = .055$. No statistically significant differences were observed across racial/ethnic groups using $\alpha = .01$, suggesting parity in the likelihood of hospitalization across individuals of different racial/ethnic identities. This finding does not support Hypothesis 1, as I predicted that being part of an underrepresented group would be associated with *less* use of non-emergency services.

In Block 3, binary FS status was entered into the model, with 'food secure' as the omitted group, $F(1) = 5.37$, $p = .021$, indicating that FS status was not predictive of being hospitalized overnight. This finding did not support Hypothesis 2, as I predicted that FI would be associated with greater healthcare use. In Block 4, interaction terms were entered into the model and were not statistically significant, $F(6) = 1.27$, $p = .269$, suggesting that racial/ethnic identity did not act as a moderator in this model, and addressing Research Question 3 (does race/ethnicity moderate the relationship between FI and healthcare use?). See Table 2 for details.

The model was then functionally 'reset' to Block 2 (i.e., only covariates and race/ethnicity entered). In Block 5, linear FS status was entered into the model, $F(1) = 9.38$, $p = .002$, suggesting that being food insecure was associated with greater odds of being hospitalized overnight. Every one-unit increase in the FS status scale (i.e., every one-unit increase in the level of FI) was associated with a trivial effect size, $OR = 1.05$, 95% CI [1.02, 1.08]. This finding provided support for Hypothesis 2. In Block 6, interaction terms were entered and were not statistically significant, $F(6) = 1.42$, $p = .202$, which addressed Research Question 3. See Table 2 for details.

Number of Overnight Hospitalizations

The number of overnight hospitalizations was regressed onto covariates in Block 1, $F(25) = 50.77$, $p < .001$. Racial/ethnic identity was entered in Block 2, although none of the individual racial/ethnic groups demonstrated a statistically significant association with the outcome, $F(6) = 3.16$, $p = .004$. This finding did not support Hypothesis 1, as I predicted racialized identity would be associated with less use of non-emergency care.

In Block 3, binary FS status was entered into the model and was not found to be predictive of the number of overnight hospitalizations, $F(1) = 0.00$, $p = .977$. This did not support Hypothesis 2, as I predicted FI would be associated with greater odds of using healthcare services. In Block 4, interaction terms were entered, though none were statistically significant, $F(6) = 1.73$, $p = .109$, which addressed Research Question 3 (does race/ethnicity moderate the relationship between FI and healthcare use?). See Table 3 for details.

In Block 5, after the model was 'reset', linear FS status was entered and was not found to be predictive of the number of hospitalizations, $F(1) = 0.37$, $p = .544$, which did not support Hypothesis 2. In Block 6, interaction terms were entered into the model, none of which were statistically significant, $F(6) = 1.18$, $p = .314$. This addressed Research Question 3. See Table 3 for details.

Number of Visits to the Emergency Room

The number of visits to the ER was regressed onto covariates in Block 1, $F(25) = 54.22$, $p < .001$. In Block 2, race/ethnicity was entered into the model, $F(6) = 2.53$, $p <$

.001. Indigenous identity was associated with a greater number of ER visits and with a trivial effect size, *IRR* = 1.31, whereas Asian identity was associated with fewer visits and with a small effect size, *IRR* = 0.57. Overall, the results were largely unsupportive of Hypothesis 1, as I predicted that being a member of an underrepresented group would be associated with greater odds of using emergency healthcare services, which was only observed in respondents identifying as Indigenous.

In Block 3, binary FS status was entered into the model, $F(1) = 29.88$, $p < .001$. FI was associated with a greater number of ER visits and with a small effect size, *IRR* = 1.50. This was supportive of Hypothesis 2, as I predicted that FI would be associated with greater utilization of healthcare services. In Block 4, interaction terms were entered, none of which were statistically significant, $F(6) = 1.71$, $p = .114$. This addressed Research Question 3 (does race/ethnicity moderate the relationship between FI and healthcare use?). See Table 4 for details.

In Block 5, after the model was 'reset', linear FS status was entered into the model, $F(1) = 23.67$, $p < .001$. This suggested that FI was positively associated with the number of visits to the ER, with every one-unit change in the FS status scale associated with a trivial effect size, *IRR* = 1.10. This finding was supportive of Hypothesis 2. In Block 6, interaction terms were entered, $F(6) = 2.11$, $p = .049$, and the interaction term for Latinx identity was statistically significant, *IRR* = 1.26, $p = .002$, $t = 3.10$, 95% CI [1.09, 1.46]. A follow-up examination of the marginal means estimates indicated that among respondents at the lowest level of the FS status scale FI (i.e., respondents who are food secure, receiving a score of 0 on the 11-point scale), respondents who are White reported 1.5 times more visits to the ER than did respondents who are Latinx. More specifically, respondents who are White reported an average of 0.37 visits, whereas respondents who are Latinx reported an average of 0.24 visits (see Figure 1). Among respondents at the highest level of the FS status scale (i.e., respondents who are severely food insecure, receiving the maximum score of 10), respondents who are Latinx reported 6.5 times more visits to the ER than respondents who are White, comparing an average of 6.35 visits to an average of 0.97 visits (see Figure 1). This addressed Research Question 3. See Table 4 for details.

Number of Visits to a Family Doctor or General Practitioner

The number of visits to a family doctor or GP was regressed onto covariates in Block 1, $F(25) = 131.10$, $p < .001$. In Block 2, race/ethnicity was entered into the model and was not predictive of the number of visits to a family doctor or GP, $F(6) = 0.71$, $p = .643$. This did not support Hypothesis 1, as I predicted that racialized identity would be associated with less use of non-emergency care.

In Block 3, binary FS status was entered into the model, $F(1) = 20.33$, $p < .001$, suggesting that being food insecure was associated with a greater number of visits to a family doctor or GP and with a trivial effect size, *IRR* = 1.15. This provided support for Hypothesis 2: I predicted FI would be associated with greater odds of using healthcare services. In Block 4, interaction terms were entered, none of which were statistically significant, $F(6) = 0.38$, $p = .890$. This addressed Research Question 3 (does race/ethnicity moderate the relationship between FI and healthcare use?). See Table 5 for details.

In Block 5, after the model was ‘reset’, linear FS status was entered into the model, $F(1) = 33.24$, $p < .001$, with FI being positively associated with the number of visits to a family doctor or GP. Every one-unit change in the FS status scale was associated with a trivial effect size, *IRR* = 1.04. This finding provided support for Hypothesis 2. In Block 6, interaction terms were entered, none of which were statistically significant, $F(6) = 0.70$, $p = .647$, addressing Research Question 3. See Table 5 for details.

Number of Visits to a Medical Specialist

The number of visits to a medical specialist was regressed onto covariates in Block 1, $F(25) = 30.62$, $p < .001$. In Block 2, racial/ethnic identity was entered into the model, $F(6) = 3.49$, $p = .002$: respondents who are Asian, Latinx, or Arab reported lower rates of visits to a specialist compared to respondents who are White. All effects were of a small size: *IRR* = 0.61, *IRR* = 0.60, and *IRR* = 0.56, respectively. These findings partially supported Hypothesis 1, as I predicted that racialized identity would be associated with lower odds of using non-emergency health services.

In Block 3, binary FS status was entered into the model and was not found to be predictive of the number of visits to a medical specialist, $F(1) = 1.61$, $p = .204$. This did not support Hypothesis 2, as I predicted that FI would be associated with greater odds of using healthcare services. In Block 4, interaction terms were entered, none of which were statistically significant, $F(6) = 0.35$, $p = .913$. This addressed Research Question 3 (does race/ethnicity moderate the relationship between FI and healthcare use?). See Table 6 for details.

In Block 5, after the model was 'reset', linear FS status was entered into the model and was not predictive of the number of visits to a medical specialist, which did not support Hypothesis 2, $F(1) = 5.11$, $p = .024$. In Block 6, interaction terms were entered, though none were statistically significant, $F(6) = 0.40$, $p = .881$. This addressed Research Question 3. See Table 6 for details.

Number of Visits to a Nurse

The number of visits to a nurse was regressed onto covariates in Block 1, $F(25) = 28.85$, $p < .001$. In Block 2, race/ethnicity was entered into the model, $F(6) = 1.58$, $p = .148$, suggesting that racial/ethnic identity was not predictive of the number of visits. This finding did not support Hypothesis 1, as I predicted that racialized identity would be associated with lower odds of using non-emergency healthcare services.

In Block 3, binary FS status was entered into the model and was not predictive of the number of visits to a nurse, $F(1) = 4.01$, $p = .045$. This did not support Hypothesis 2, as I predicted that FI would be associated with greater odds of using healthcare services. In Block 4, interactions terms were entered, none of which were statistically significant, $F(6) = 1.12$, $p = .347$. This addressed Research Question 3 (does race/ethnicity moderate the relationship between FI and healthcare use?). See Table 7 for details.

In Block 5, after the model was 'reset', linear FS status was entered into the model, which was not predictive of the number of visits to a nurse and therefore did not support Hypothesis 2, $F(1) = 4.29$, $p = .038$. In Block 6, interaction terms were entered, none of which were statistically significant, $F(6) = 0.91$, $p = .486$, addressing Research Question 3. See Table 7 for details.

Healthcare Barriers: Research Questions 4, 5, and 6

Research Question 4 focused on racial/ethnic differences in access to care: it was hypothesized that being a member of a racialized group would be associated with greater odds of facing barriers to accessing healthcare services. Research Question 5 examined the FS status-healthcare barrier association: it was hypothesized that FI would be associated with greater odds of reporting barriers to accessing care. Research Question 6 explored whether race/ethnicity moderated the relationship between FI and healthcare barriers: no formal hypothesis was generated.

Having a Source for Immediate Care for Minor Health Problem

Covariates were entered into the model in Block 1, $F(25) = 33.58$, $p < .001$. In Block 2, race/ethnicity was entered and was not found to be predictive of having a source for immediate care for a minor health problem, $F(6) = 0.47$, $p = .829$. This did not support Hypothesis 3, as I predicted that BIPOC identity would be associated with greater barriers to accessing care.

In Block 3, binary FS status was entered into the model and was not predictive of having a source for immediate care, $F(1) = 0.05$, $p = .826$. This finding did not support Hypothesis 4, as I predicted that FI would be associated with greater barriers to accessing care. In Block 4, none of the interaction terms were statistically significant, $F(6) = 0.95$, $p = .461$, addressing Research Question 6 (does race/ethnicity moderate the relationship between FI and healthcare barriers?). See Table 8 for details.

In Block 5, after the model was 'reset', linear FS status was entered into the model but was not predictive of having a source for immediate care, $F(1) = 1.20$, $p = .273$. This did not support Hypothesis 4. In Block 6, none of the interaction terms were statistically significant, $F(6) = 0.54$, $p = .777$, addressing Research Question 6. See Table 8 for details.

Having a Regular Care Provider

Covariates were entered into the model in Block 1, $F(25) = 103.70$, $p < .001$. In Block 2, race/ethnicity was entered into the model, $F(6) = 4.20$, $p < .001$. Respondents who are Arab were less likely to have a regular care provider, reporting a small effect size, $OR = 0.53$, 95% CI [0.38, 0.75]. Overall, the results of Block 2 did not provide much support for Hypothesis 3, as I predicted that BIPOC identity would be associated with greater barriers to accessing care.

In Block 3, binary FS status was entered into the model and was not predictive of having a regular care provider, $F(1) = 4.53$, $p = .033$. This did not support Hypothesis 4, as I predicted FI would be associated with greater barriers to care. In Block 4, none of the interaction terms were statistically significant, $F(6) = 0.29$, $p = .944$, addressing Research Question 6 (does race/ethnicity moderate the relationship between FI and healthcare barriers?). See Table 9 for details.

In Block 5, after the model was 'reset', linear FS status was entered into the model, $F(1) = 8.28$, $p = .004$. FI was found to be negatively associated with having a regular care provider: every one-unit change in the FS status scale was associated with a trivial effect size, $OR = 0.96$, 95% CI [0.94, 0.99]. This provided support for Hypothesis 4. In Block 6, none of the interaction terms were statistically significant, $F(6) = 0.86$, $p = .526$, addressing Research Question 6. See Table 9 for details.

Experiencing a Problematic Wait Time for Last Medical Appointment

Covariates were entered into the model in Block 1, $F(25) = 12.98$, $p < .001$. In Block 2, race/ethnicity was entered, $F(6) = 6.38$, $p < .001$. Respondents who are Asian reported greater odds of experiencing a problematic wait time for their last medical appointment, with a small effect size, *OR* = 2.01, 95% CI [1.58, 2.55]. The results of Block 2 largely did not support Hypothesis 3, as I predicted that BIPIOC identity would be associated with greater barriers to accessing care.

In Block 3, binary FS status was entered into the model, $F(1) = 45.55$, $p < .001$. FI was associated with greater odds of experiencing a problematic wait time and with a small effect size, *OR* = 1.79, 95% CI [1.51, 2.12]. This supported Hypothesis 4, as I predicted that FI would be associated with greater barriers to care. In Block 4, none of the interaction terms were statistically significant, $F(6) = 0.88$, $p = .508$, which addressed Research Question 6 (does race/ethnicity moderate the relationship between FI and healthcare barriers?). See Table 10 for details.

In Block 5 after the model was 'reset', linear FS status was entered into the model, $F(1) = 38.70$, $p < .001$. Greater FI was associated with greater odds of experiencing a problematic wait time, and every one-unit change in the FS status scale was associated with a trivial effect size, *OR* = 1.12, 95% CI [1.08, 1.16]. This supported Hypothesis 4. In Block 6, none of the interaction terms were statistically significant, $F(6) = 1.02$, $p = .410$, which addressed Research Question 6. See Table 10 for details.

Having to Wait a Week or More for Immediate Care for a Minor Health Problem

Covariates were entered into the model in Block 1, $F(25) = 36.96$, $p < .001$. In Block 2, race/ethnicity was entered into the model, $F(6) = 3.62$, $p = .001$. Respondents who are Asian reported *lower* odds of having to wait a week or more for care for a minor health problem, with a small effect size, *OR* = 0.68, 95% CI [0.57, 0.83]. The results for Block 2 did not support Hypothesis 3, as I predicted that BIPOC identity would be associated with greater barriers to accessing care.

In Block 3, binary FS status was entered into the model, $F(1) = 6.08$, $p = .014$. Results suggested that FS status was not predictive of having to wait a week or more for care. This did not support Hypothesis 4, as I predicted FI would be associated with greater barriers to care. In Block 4, none of the interaction terms were statistically significant, $F(6) = 0.43$, $p = .862$, addressing Research Question 6 (does race/ethnicity moderate the relationship between FI and healthcare barriers?). See Table 11 for details.

In Block 5, after the model was 'reset', linear FS status was entered into the model and was not predictive of having to wait a week or more for care, $F(1) = 4.74$, $p = .030$. This did not support Hypothesis 4. In Block 6, none of the interaction terms were statistically significant, $F(6) = 0.54$, $p = .781$, addressing Research Question 6. See Table 11 for details.

Having to Wait a Week or More to See a Health Professional for a Consultation

Covariates were entered into the model in Block 1, $F(25) = 33.00$, $p < .001$. In Block 2, race/ethnicity was entered into the model, $F(6) = 5.62$, $p = .001$. Being Indigenous and being Asian were both associated with lower odds of having to wait a week or more to see a professional: the effect for Indigenous identity was of trivial size, $OR = 0.79$, 95% CI [0.67, 0.93], and the effect for Asian identity was small, $OR = 0.69$, 95% CI [0.58, 0.82]. Therefore, the results of Block 2 did not support Hypothesis 3, as I predicted that BIPOC identity would be associated with greater barriers to accessing care.

In Block 3, binary FS status was entered into the model and was not predictive of having to wait a week or more for a consultation, $F(1) = 0.29$, $p = .592$. This finding did not support Hypothesis 4, as I predicted FI would be associated with greater barriers to care. In Block 4, none of the interaction terms were statistically significant, $F(6) = 1.63$, p

= .134, addressing Research Question 6 (does race/ethnicity moderate the relationship between FI and healthcare barriers?). See Table 12 for details.

In Block 5, after the model was 'reset', linear FS status was entered into the model, $F(1) = 0.01$, $p = .939$. Again, FS status was not predictive of having to wait a week or more for a consultation, thereby not supporting of Hypothesis 4. In Block 6, none of the interaction terms were statistically significant, $F(6) = 2.28$, $p = .034$, addressing Research Question 6. See Table 12 for details.

Skipping Prescription Refills or Doses Due to Cost

Covariates were entered into the model in Block 1, $F(25) = 35.76$, $p < .001$. In Block 2, race/ethnicity was entered into the model and was not predictive of skipping prescriptions due to cost, $F(6) = 1.35$, $p = .232$. This did not support Hypothesis 3, as I predicted that BIPOC identity would be associated with greater barriers to accessing care.

In Block 3, binary FS status was entered into the model, $F(1) = 255.60$, $p < .001$. FI was associated with greater odds of skipping prescriptions and with a medium effect size, $OR = 3.34$, 95% CI [2.88, 3.87]. This provided support for Hypothesis 4, as I predicted FI would be associated with greater barriers to care. Interaction terms were entered in Block 4, $F(6) = 2.70$, $p = .013$. The interaction between binary FS status and Indigenous identity was statistically significant, $OR = 0.46$, $p < .001$, $t = -3.33$, 95% CI [0.29, 0.72], addressing Research Question 6 (does race/ethnicity moderate the relationship between FI and healthcare barriers?). The post-hoc pairwise comparisons indicated however that there were no statistically significant differences in the point estimates for respondents who are Indigenous compared to respondents who are White within the ‘food secure’ group (*b* = 0.02, *SE* = 0.01, *p* = .020), nor the ‘food insecure’ group (*b* = -0.02, *SE* = 0.01, *p* = .085; see Figure 2). See Table 13 for details.

In Block 5, after the model was ‘reset’, linear FS status was entered into the model, $F(1) = 296.38$, $p < .001$. FI was positively associated with the odds of skipping prescriptions and every one-unit change in the FS status scale was associated with a trivial effect size, *OR* = 1.29, 95% CI [1.25, 1.33]. This provided support for Hypothesis 4. In Block 6, interaction terms were entered, $F(6) = 4.41$, $p < .001$. The interaction between linear FS status and Indigenous identity was statistically significant, *OR* = 0.85, $p < .001$, $t = -4.38$, 95% CI [0.79, 0.91]. A follow-up examination of the marginal means estimates indicated that among respondents at the lowest level of FI, respondents who are Indigenous were 1.5 times more likely than respondents who are White to skip prescriptions. Respondents who are Indigenous reported an average likelihood of 6.0%, whereas respondents who are White reported an average likelihood of 4.0% (see Figure 3). Among respondents at the highest level of FI, however, respondents who are White were 2.3 times more likely to report skipping prescriptions than respondents who are Indigenous, comparing an average likelihood of 35.0% to an average of 15.0% (see Figure 3). This addressed Research Question 6. See Table 13 for details.

Mental Health Service Use: Research Question 7, 8, and 9

Research Question 7 focused on racial/ethnic differences in using mental health services: it was hypothesized that being a member of a racialized group would be associated with less use of mental health services. Research Question 8 examined the FS status-mental health service use association: it was hypothesized that FI would be associated with greater odds of seeking mental health support. Research Question 9 explored whether race/ethnicity moderated the relationship between FI and mental health service use: no formal hypothesis was generated.

Having Visited Any Professional About Mental Health

Covariates were entered into the model in Block 1, $F(25) = 118.51$, $p < .001$. In Block 2, race/ethnicity was entered, $F(6) = 6.64$, $p < .001$. Respondents identifying as Asian, Black, or Latinx were less likely to visit a mental health professional, and all boasting small effect sizes: *OR* = 0.50, 95% CI [0.39, 0.63]; *OR* = 0.51, 95% CI [0.31, 0.82]; and *OR* = 0.52, 95% CI [0.33, 0.81], respectively. This partially supported Hypothesis 5, as I predicted that racialized identity would be associated with less use of mental health services.

In Block 3, binary FS status was entered into the model, $F(1) = 13.88$, $p < .001$. FI was associated with greater odds of visiting a professional about mental health and with a trivial effect size, *OR* = 1.24, 95% CI [1.11, 1.39]. This provided support for Hypothesis 6, as I predicted that FI would be associated with greater mental health service use. In Block 4, interaction terms were explored, $F(6) = 2.55$, $p = .018$. The interaction between binary FS status and Arab identity was statistically significant, *OR* = 0.20, $p = .002$, $t = -3.12$, 95% CI [0.07, 0.55], addressing Research Question 9 (does race/ethnicity moderate the relationship between FI and mental health service use?). In a follow-up examination of the marginal means estimates, among the 'food secure' group, respondents who are Arab reported comparable odds of seeing a mental health professional to respondents who are White, $b = 0.01$, $SE = 0.03$, $p = .768$ (see Figure 4); however, among the 'food insecure' group, respondents who are White were 4.3 times more likely than respondents who are Arab to report visiting a professional. Respondents who are White reported an average likelihood of 13.0%, whereas respondents who are Arab reported an average likelihood of 3.0% (b = -0.10, SE = 0.01, p < .001; see Figure 4). See Table 14 for details.

In Block 5, after the model was 'reset', linear FS status was entered into the model, $F(1)$ = 37.39, p < .001. FI was positively associated with the likelihood of visiting a mental health professional: every one-unit change in the FS status scale was associated with a trivial effect size, OR = 1.07, 95% CI [1.05, 1.10]. This finding was supportive of Hypothesis 6. In Block 6, none of the interaction terms were statistically significant, $F(6)$ = 1.34, p = .236, which addressed Research Question 9. See Table 14 for details.

Having Visited a Family Doctor or General Practitioner About Mental Health

Covariates were entered into the model in Block 1, $F(25)$ = 12.76, p < .001. In Block 2, race/ethnicity was entered into the model and was not found to be predictive of visiting a family doctor or GP about mental health, $F(6)$ = 0.75, p = .612. This finding did not support Hypothesis 5, as I predicted racialized identity would be predictive of less use of mental health services

In Block 3, binary FS status was entered into the model and was not predictive of visiting a doctor or GP about mental health, $F(1)$ = 0.00, p = .982. This did not support Hypothesis 6, as I predicted FI would be associated with greater use of mental health services. In Block 4, none of the interaction terms were statistically significant aside from the interaction for the 'Other' group, $F(6)$ = 2.01, p = .061, addressing Research Question 9 (does race/ethnicity moderate the relationship between FI and mental health service use?). See Table 15 for details.

In Block 5, after the model was 'reset', linear FS status was entered into the model and was not predictive of visiting a doctor or GP about mental health, $F(1)$ = 0.82,

p = .364. This was not supportive of Hypothesis 6. In Block 6, none of the interaction terms were statistically significant, $F(6) = 1.27$, $p = .269$, addressing Research Question 9. See Table 15 for details.

Having Visited a Psychiatrist

Covariates were entered into the model in Block 1, $F(25) = 8.57$, $p < .001$. In Block 2, race/ethnicity was entered into the model and was not predictive of visiting a psychiatrist, $F(6) = 1.46$, $p = .189$. This did not support Hypothesis 5, as I predicted racialized identity would be associated with lower utilization of mental health services.

In Block 3, binary FS status was entered into the model and was not predictive of visiting a psychiatrist, $F(1) = 5.69$, $p = .017$. This did not support Hypothesis 6, as I predicted FI would be associated with greater use of mental health services. In Block 4, interaction terms were entered, $F(6) = 2.39$, $p = .026$, and the interaction between binary FS status and Arab identity was statistically significant, $OR = 14.90$, $p = .008$, $t = 2.65$, 95% CI [2.01, 110.22], addressing Research Question 9 (does race/ethnicity moderate the relationship between FI and mental health service use?). In a follow-up examination of the marginal means estimates, among the ‘food secure’ groups, respondents who are White were 6.5 times more likely to have visited a psychiatrist compared to respondents who are Arab (13.0% likelihood versus 2.0% likelihood), $b = -0.11$, $SE = 0.02$, $p < .001$ (see Figure 5). Among the ‘food insecure’ group, respondents who are White reported comparable odds of having visited a psychiatrist as did respondents who are Arab, $b = 0.10$, $SE = 0.13$, $p = .435$ (see Figure 5). See Table 16 for details.

In Block 5, after the model was ‘reset’, linear FS status was entered into the model, $F(1) = 8.89$, $p = .003$. FI was found to be positively associated with visiting a psychiatrist: every one-unit change in the FS status scale was associated with a trivial effect size, *OR* = 1.07, 95% CI [1.02, 1.11]. This finding supported Hypothesis 6, as I predicted FI would be associated with greater use of mental health services. In Block 6, none of the interaction terms were statistically significant, $F(6) = 0.59$, $p = .736$, addressing Research Question 9. See Table 16 for details.

Having Visited a Psychologist

Covariates were entered into the model in Block 1, $F(25) = 14.72$, $p < .001$. In Block 2, race/ethnicity was entered into the model, $F(6) = 1.88$, $p = .080$. Indigenous identity was associated with reduced odds of visiting a psychologist, with a small effect size, *OR* = 0.61, 95% CI [0.42, 0.88]. Overall, the results of Block 2 did not lend much support to Hypothesis 5, as I predicted that racialized identity would be associated with lower use of mental health services.

In Block 3, binary FS status was entered into the model and was not predictive of visiting a psychologist, $F(1) = 0.51$, $p = .476$. This did not support Hypothesis 6, as I predicted that FI would be associated with greater use of mental health services. In Block 4, none of the interaction terms were statistically significant besides the interaction for the ‘Other’ group, $F(6) = 1.89$, $p = .079$. This addressed Research Question 9 (does race/ethnicity moderate the relationship between FI and mental health service use?). See Table 17 for details.

In Block 5, after the model was ‘reset’, linear FS status was entered into the model and was not predictive of visiting a psychologist, $F(1) = 0.23$, $p = .797$, thereby not supporting Hypothesis 6. In Block 4, none of the interaction terms were statistically significant beyond that of the ‘Other’ group, $F(6) = 1.85$, $p = .086$, addressing Research Question 9. See Table 17 for details.

Having Visited a Social Worker or Counsellor

Covariates were entered into the model in Block 1, $F(25) = 7.72$, $p < .001$. In Block 2, race/ethnicity was entered into the model, $F(6) = 2.84$, $p = .009$, although none of the individual BIPOC identities demonstrated a statistically significant association with visiting a social worker or counsellor. This did not support Hypothesis 5, as I predicted racialized identity would be associated with less use of mental health services.

In Block 3, binary FS status was entered into the model and was not predictive of visiting a social worker or counsellor, $F(1) = 3.00$, $p = .083$. This did not support Hypothesis 6, as I predicted that FI would be associated with greater mental health service use. In Block 4, none of the interaction terms were statistically significant aside from the interaction for the ‘Other’ group, $F(6) = 2.73$, $p = .012$. This addressed Research Question 9 (does race/ethnicity moderate the relationship between FI and mental health service use?). See Table 18 for details.

In Block 5, after the model was ‘reset’, linear FS status was entered into the model and was not predictive of visiting a social worker or counsellor, $F(1) = 1.91$, $p = .167$. This finding did not support Hypothesis 6. In Block 4, none of the interaction terms were statistically significant beyond that for the ‘Other’ group, $F(6) = 3.02$, $p = .006$. This addressed Research Question 9. See Table 18 for details.

Number of Visits to a Mental Health Professional

Covariates were entered into the model in Block 1, $F(25) = 81.45$, $p < .001$. In Block 2, race/ethnicity was entered into the model, $F(6) = 3.69$, $p = .001$. Respondents identifying as Black or as Latinx reported less mental health visits, and both with small effect sizes: *IRR* = 0.42, and *IRR* = 0.47, respectively. These results partially supported Hypothesis 5, as I predicted that racialized identity would be associated with less use of mental health services.

In Block 3, binary FS status was entered and was not predictive of the number of mental health visits, $F(1) = 4.69$, $p = .030$. This finding did not support Hypothesis 6, as I predicted FI would be associated with greater use of mental health services. In Block 4, none of the interaction terms were statistically significant, $F(6) = 0.75$, $p = .611$. This addressed Research Question 9 (does race/ethnicity moderate the relationship between FI and mental health service use?). See Table 19 for details.

The model was 'reset.' In Block 5, linear FS status was entered into the model and was not predictive of the number of mental health visits, $F(1) = 4.71$, $p = .030$. This did not support Hypothesis 6. In Block 6, none of the interaction terms were statistically significant, $F(6) = 0.65$, $p = .694$, addressing Research Question 9. See Table 19 for details.

Discussion

The current study examined nine research questions: three focusing on the associations between race/ethnicity and healthcare use, barriers to care, and mental health service use; three focusing on the associations between FI and these three types of healthcare outcomes; and three examining race/ethnicity as a moderator of the FI-healthcare associations. Results were presented based on the type of healthcare outcome (i.e., healthcare use, barriers to care, or mental health service use). A summary of the hypotheses and whether they were supported is presented in Table 20. Please note that no formal hypotheses were generated for Research Question 3, Research Question 6, and Research Question 9: these were novel explorations for the Canadian literature regarding the potential interaction between FS status and race/ethnicity.

Healthcare Use

Main Effect of Race/Ethnicity (Research Question 1)

In the current study, racial/ethnic identity was not a consistent predictor of the utilization of healthcare services. In Hypothesis 1, I predicted that identifying as a member of an underrepresented group would be associated with greater *emergency* medical health service use and less *non-emergency* service use, relative to the White reference group. My hypothesis was supported by how respondents who are Indigenous reported a greater number of ER visits, and how respondents who are Asian, Latinx, or Arab reported fewer visits to a medical specialist. Beyond these few cases, however, Hypothesis 1 was not supported: respondents who are Asian reported *fewer* visits to the ER, and any other association between a racialized identity and a healthcare use outcome was *not* statistically significant at $\alpha = .01$. Therefore, race/ethnicity was not predictive of four of the relevant outcomes: being hospitalized overnight, number of overnight hospitalizations, number of visits to a family doctor or GP, and number of visits to a nurse. Overall, results of the current study provided limited support for Hypothesis 1.

Nevertheless, these results do provide support for the existing Canadian literature, such as for the finding that people who are Asian are less likely to access specialized care services (Yang et al., 2014) and for the finding that Indigenous Peoples report a greater number of ER visits (Firestone et al., 2014), compared to people who are White. The current study did however fail to replicate some of the previous findings from the literature, despite using a provincially representative sample, such as people who are Black being more likely to use emergency services (Boudreaux et al., 2003) and Indigenous Peoples reporting greater rates of hospitalizations (Marrie et al., 2004), compared to people who are White. Instead, results suggest that the help-seeking trends of these racial/ethnic groups are statistically comparable to their White counterparts.

The general lack of support for Hypothesis 1 could be due to the general nature of my prediction: because there was not literature available on the healthcare use patterns for all racial/ethnic groups examined in the current study, I formulated the same hypothesis for *all* BIPOC groups, even though this is an extremely heterogeneous group. The current results suggest that not all BIPOC groups are comparable in their use of all healthcare services, and thus formulating specific predictions may be warranted when examining racial/ethnic differences in healthcare outcomes. This reflects how only examining a White versus non-White dichotomy is likely an erroneous oversimplification (Selvarajah et al., 2020). For example, respondents who are Indigenous reported a greater number of ER visits than did respondents who are White, but respondents who are Asian reported fewer visits, suggesting a difference in the help-seeking trends observed *within* the overarching BIPOC group. Therefore, it could be the case that there are racial/ethnic differences in service use that are being overlooked due to BIPOC individuals being categorized into one very heterogeneous group, resulting in the reduction or even masking of differences within this overarching category (Selvarajah et al., 2020).

Main Effect of Food Insecurity (Research Question 2)

Across the binary and linear measures of FS status, FI was predictive of some of the outcomes related to the utilization of health services. In Hypothesis 2, I predicted FI would be associated with greater healthcare use. Both binary and linear FS status were associated with a greater number of ER visits and with a greater number of visits to a family doctor or GP. Additionally, linear FS status was predictive of being hospitalized overnight; however, neither binary nor linear FS status were predictive of the number of overnight hospitalizations, the number of visits to a specialist, or the number of visits to a nurse. Overall, these findings partially support Hypothesis 2.

These results do provide support for previous findings, such as FI being linked to greater odds of visiting the ER in the U.S. (Janio & Sorkin, 2021). Additionally, results from the analysis with linear FS status provide support for the finding from the Canadian literature that FI acts as a predictor of overnight hospitalization (Gucciardi et al., 2009). Importantly, this finding also highlights a difference in interpretation when using one method of modelling FS status over another, given that binary FS status was *not* found to be predictive of overnight hospitalization.

Although the results for such analyses were not statistically significant, there were several unique relationships between FS status and healthcare use outcomes that were, to my knowledge, examined for the first time using a Canadian sample. For example, results of the current study indicated that FS status was *not* predictive of the number of visits to a medical specialist, nor of the number of visits to nurse: these non-significant findings are nevertheless novel contributions to the Canadian literature and may be indicative of the influence of FI on medical help-seeking behaviours (e.g., FI may be linked to *emergency* rather than non-emergency service use; Janio & Sorkin, 2021). This could speak to (a lack of) access to preventive care (Fitzpatrick et al., 2015), or to a greater health need (Andersen & Newman, 1973), among people experiencing FI.

Interaction Between Food Insecurity and Race/Ethnicity (Research Question 3)

One of the primary goals of the current study was to examine whether race/ethnicity moderated the association between FI and healthcare use. Although I did not generate a hypothesis for Research Question 3, I did posit that, following the logic of syndemic theory (Singer et al., 2017), being food insecure and identifying as BIPOC would both have implications for health, which would thus have implications for healthcare utilization, given that illness severity is predictive of service use (Andersen & Newman, 1973).

Only one interaction term was found to be statistically significant in the healthcare use models: Latinx identity moderated the association between linear FS status and the number of ER visits. Experiencing FI was associated with a greater increase in the number of ER visits for respondents who are Latinx respondents compared to respondents who are White, although no definitive conclusions can be drawn about this association given that the pairwise comparisons could not be released for the linear FS measure. Nevertheless, this could be indicative of a greater, compounded need for emergency care amongst individuals who are both Latinx and food insecure, as would be suggested by syndemic theory (Singer et al., 2017). Overall, however, the results of the current study suggest that racial/ethnic identity generally does *not* moderate the association between FS status and healthcare use.

Given that Research Question 3 was a novel exploration for the Canadian literature, comparisons between these results and previous findings from the literature are limited. An American study did report that Black identity moderated the association between FS status and utilization of emergency or hospital services (O'Malley et al., 2017), but this finding was not replicated in the current study. This difference likely owes to the differences in samples being compared: the study from O'Malley and colleagues examined a sample of epileptic children from an American hospital, whereas the sample for the current study was comprised of adults from the general Canadian population. Although FI has been linked to greater odds of visiting the ER for both children (Peltz & Garg, 2019) and adults (Janio & Sorkin, 2021), having epilepsy is itself associated with greater use of emergency care (Cramer et al., 2014), which likely played a role in the results reported by O'Malley and colleagues. Additionally, Canada operates via a universal healthcare system (Allin et al., 2020), whereas the U.S. operates via a privatized healthcare system with little emphasis on cost control (Bozic, 2013), resulting in differences in the *affordability* of care between the two countries, which would have implications for help-seeking behaviours (Andersen & Newman, 1973).

Barriers to Care

Main Effect of Race/Ethnicity (Research Question 4)

Race/ethnicity was not a consistent predictor of health service accessibility in the current study. In Hypothesis 3, I predicted that being a member of an underrepresented group would be associated with greater barriers to accessing care, which was supported by the finding that respondents who are Arab were less likely to have a regular care provider, and by the finding that respondents who are Asian were more likely to experience problematic wait times for appointments. Beyond these select instances, however, Hypothesis 3 was not supported: respondents who are Asian were found to be less likely to have to wait a week or more for care for a minor health problem, respondents who are Indigenous or Asian were less likely to have to wait a week or more for a medical consultation, and any other association between race/ethnicity and a healthcare barrier outcome was *not* statistically significant. Therefore, racial/ethnic identity was not predictive of two of the outcomes related to healthcare barriers (i.e., having a source for immediate care for a minor health problem and skipping prescriptions due to cost). Therefore, Hypothesis 3 received limited support.

The results of the current study provided some support for previous findings from the literature, such as Canadians identifying as BIPOC being more likely to not have a regular medical doctor (Lebrun & Shi, 2011). In the current study, respondents who are Arab were found to be less likely than respondents who are White to have a regular care provider; however, this means that people of any other BIPOC identity that was measured in the current study demonstrated statistically comparable odds of having a regular care provider as the (White) reference group, thereby simultaneously conflicting with previous findings (Lebrun & Shi, 2011). A potential explanation for this lack of support is that some studies from the literature have compared people who are White to an overarching BIPOC group (e.g., Lebrun & Shi, 2011), and thus the relationships of interest may no longer be comparable once unique BIPOC groups are parsed out from this overarching 'non-White' group (Selvarajah et al., 2020).

Another potential explanation for the lack of support for previous findings is that there was limited data to compare these results. The healthcare barrier outcomes examined in the current study did not always overlap with previously used measures, such as experiencing prolonged wait times for surgeries (Yeates et al., 2004), and discrimination as a hinderance to care (Kitching et al., 2020). Such measures were not available in the 2015-2016 CCHS dataset.

Again, as discussed for Hypothesis 1, this general lack of support for Hypothesis 3 regarding racial/ethnic differences could be due to my prediction being extremely general: I had formulated the same hypothesis for *all* BIPOC groups due to the Canadian literature lacking an extensive examination into healthcare accessibility across specific racial/ethnic groups. The results of the current study would suggest that amalgamating all BIPOC groups into one overarching identity for research purposes is not appropriate (Selvarajah et al., 2020), given that there were differences observed *within* this overarching group. For example, being Indigenous and being Asian were both associated with reduced odds of having to wait a week or more for a consultation, but all other BIPOC identities measured in the current study (i.e., Black, Latinx, and Arab identity) were associated with comparable odds to the (White) reference group.

Main Effect of Food Insecurity (Research Question 5)

Across the binary and linear measures of FS status, FI was predictive of some of the healthcare accessibility outcomes. For Hypothesis 4, I predicted that FI would be associated with greater barriers to accessing care: the hypothesis was supported insofar that linear FS status was predictive of having a regular care provider, and that both binary and linear FS status were predictive of experiencing a problematic wait time for a medical appointment, of greater odds of having to wait a week or more for care for a minor health problem, and of skipping prescription refills or doses due to cost. Nevertheless, neither method of modelling FS status was predictive of having a source for immediate care for a minor health problem, nor of having to wait a week or more for a medical consultation. Overall, the results partially support Hypothesis 4.

Although the extant literature on the association between FI and barriers to care is limited, especially from a Canadian perspective, results from the current work lend support to previous findings. For example, experiencing FI has been linked to greater healthcare expenditures (Fitzpatrick et al., 2015; Tarasuk et al., 2015), which is thought to be related to poor access to primary or preventive care (Fitzpatrick et al., 2015). Results of the current study support this theory, as (linear) FI was associated with greater odds of not having a regular care provider, and FI was associated with experiencing problematic wait times for immediate care for minor health problems. In other words, FI was linked to hinderances to primary or preventive care in the current study. Additionally, results also support findings from the American literature that have yet to be examined in a Canadian context, such as the finding that adults who are food insecure are more likely to delay prescriptions than their food secure counterparts (Becerra et al., 2021). Given the inextricable link between FS status and (limited) monetary resources (Gundersen & Ziliak, 2015; Tarasuk & Mitchell, 2020), this association is not surprising.

Interaction Between Food Insecurity and Race/Ethnicity (Research Question 6)

One of the primary goals of the current study was to examine whether race/ethnicity moderated the association between FI and barriers to care. I did not generate a hypothesis for Research Question 6, although I did posit that, in following the logic of syndemic theory (Singer et al., 2017), experiencing FI and identifying as BIPOC would have implications for one's relative social context, which would influence one's access to needed care (Andersen & Newman, 1973).

Across the barrier to care models, there were only two statistically significant interaction terms: Indigenous identity moderated the association between FI and skipping prescription refills or doses due to cost, for *both* binary and linear FS status. A follow-up analysis for binary FS status however indicated that differences between the Indigenous group and the White group were not statistically significant among respondents who are food secure, nor amongst respondents who are food insecure. Additionally, the pairwise results could not be released for the linear FS model: therefore, although a non-statistical comparison indicated greater odds of skipping prescriptions for respondents who are both food insecure and White, compared to those who are food insecure and Indigenous, no definitive conclusions can be drawn here. Nevertheless, this finding could be indicative of systemic differences beyond FS status related to the affordability or accessibility of pharmaceutical care: although the effect was not observed in the current study, previous findings suggest Indigenous Peoples are more likely to report cost-related medication nonadherence than Canadians who are White (Law et al., 2018). If this is the case, then it is likely that Indigenous Peoples cannot modify their help-seeking patterns in response to FI in the same fashion as Canadians who are White. Overall, however, the results of the current study would suggest that race/ethnicity generally does *not* moderate the association between FI and healthcare accessibility.

Given the novelty of Research Question 6, there is little available data to compare to these results. A study from the U.S. demonstrated a significant interaction between Black identity and very low FS for cost-related medication underuse (Ojinnaka & Bruening, 2021), a finding that was not replicated in the current study. This could be due to the difference in samples being examined: Ojinnaka and Bruening used a sample of American cancer survivors, whereas the current study utilized a sample of the general Canadian population. This could lead to differences in results between the two studies, given how Canadians are less likely to report cost-related medication underuse than their American counterparts (Kennedy & Morgan, 2006), as well as how Canada uses a universal healthcare system (Allin et al., 2020), whereas the American healthcare system is privatized (Bozic, 2013). Therefore, the need to skip prescriptions, as well as the pressure to do so when financial resources are limited, are both likely lower in Canada.

Mental Health Service Use

Main Effect of Race/Ethnicity (Research Question 7)

Race/ethnicity did not consistently predict the utilization of mental health services in the current study. In Hypothesis 5, I predicted that BIPOC identity would be associated with reduced mental health service use. My hypothesis was supported by the following findings: respondents who are Asian, Black, or Latinx were less likely to visit a mental health professional; respondents who are Indigenous were less likely to visit a psychologist; and respondents who are Black or Latinx reported fewer visits to a mental health professional. Any other association between race/ethnicity and a mental healthcare outcome was *not* statistically significant, and therefore racial/ethnic identity was not predictive of three of the mental healthcare outcomes: visiting a family doctor or GP about mental health, visiting a psychiatrist, and visiting a social worker or counsellor. Therefore, Hypothesis 5 was only partially supported, but the findings did indicate some racial or ethnic differences in mental health help-seeking. Although these are differences in behaviour, they are likely driven, at least in part, by cultural variations in norms and attitudes toward accessing mental healthcare (Gopalkrishnan, 2018).

The results of the current study provide support for some findings from the Canadian literature, such as the finding that people who are Asian are less likely to use mental health services than people who are White (Tiwari & Wang, 2008). The current study also failed to replicate previous findings, such as Canadians who are Asian demonstrating different trends in visiting a family doctor for mental health compared to Canadians who are White (Chiu et al., 2018). The results reported herein would suggest that these racial/ethnic groups demonstrate comparable trends in visiting a family doctor for mental health.

Again, the lack of support for my hypothesis regarding racial/ethnic differences could owe to my very general prediction for all BIPOC groups, given the heterogeneity observed in this group. My prediction was so generalized because there was not sufficient literature examining the race/ethnicity-mental health service use association among the specific racial/ethnic groups examined in the current study, but such a generalization likely conceals differences between BIPOC groups (Selvarajah et al., 2020).

Main Effect of Food Insecurity (Research Question 8)

FI was not consistently predictive of the mental healthcare outcomes. In Hypothesis 6, I predicted that FI would be associated with greater mental health service use: both binary and linear FS status were found to be predictive of visiting a professional about mental health, and linear FS status was predictive of visiting a psychiatrist. Neither method of modelling FS status was predictive of four of the relevant outcomes: visiting a family doctor or GP about mental health, visiting a psychologist, visiting a social worker or counsellor, and the number of visits to a mental health professional. Therefore, the results only provide minor support for Hypothesis 6.

These findings nevertheless provide support for the scant Canadian literature on the FI-mental healthcare association, such as FI being linked to greater odds of visiting a psychiatrist (Tarasuk et al., 2018a), and FI being associated with greater odds of visiting any mental health professional (Lamont, 2021). The current study did also fail to provide support for some of the previous findings from the literature, such as FI being linked to greater odds of visiting a counsellor (H. J. Kim & Kim, 2020). This could owe to the study by H. J. Kim and Kim (2020) using a sample from Korea: the level of mental health stigmatization may be lower in Korea than in Canada, and stigmatization is one of the largest hinderances to accessing mental healthcare (H. Lee et al., 2015).

Interaction Between Food Insecurity and Race/Ethnicity (Research Question 9)

One of the main goals of the current study was to examine whether race/ethnicity moderated the association between FI and mental health service use. Although I did not generate a hypothesis for Research Question 9, I did posit that, using the logic of syndemic theory (Singer et al., 2017), experiencing FI and being a member of an underrepresented group would both have implications for mental health, and therefore would have implications for mental health service use, given that severity of mental health problems is predictive of help-seeking (Robertson & Mosher-Ashley, 2002).

Two of the mental healthcare models in the current study demonstrated statistically significant interaction effects. First, Arab identity was found to moderate the association between binary FS status and visiting a professional about mental health. Among respondents who are White, being food insecure was associated with a greater likelihood of visiting a mental health professional than was being food secure, but for respondents who are Arab, being food insecure was associated with *lower* odds of visiting a mental health professional than was being food secure. This finding may be indicative of differences in *access* to mental health supports for White versus BIPOC groups (American Psychiatric Association, 2017), and although it conflicts with the idea that vulnerability to a syndemic would result in a greater need for (and thus greater utilization of) mental healthcare (Singer et al., 2017), it *does* follow the idea that services need to be *accessible* in order to be used (Andersen & Newman, 1973).

Second, Arab identity also moderated the association between binary FS status and visiting a psychiatrist: experiencing FI was associated with a sharper increase in the likelihood of visiting a psychiatrist among respondents who are Arab compared to respondents who are White. This could be indicative of differences in service *need* between people that are food insecure and White, and people that are food insecure and Arab: mental health needs must be deemed sufficiently severe to warrant seeking care (Robertson & Mosher-Ashley, 2002), and so these results may suggest a greater mental health burden among people who are both Arab and food insecure, thereby supporting the extension of syndemic theory to this research question (Singer et al., 2017).

To my knowledge, this is the first study to examine race/ethnicity as a moderator in the association between FI and mental health service use, and so there are no previous findings to compare to my results. Overall, the findings would suggest that race/ethnicity infrequently moderates this relationship, although further study is warranted.

Syndemic Theory

This was the first known exploration of FI and race/ethnicity in tandem via syndemic theory. Syndemic theory simply postulates that experiencing two or more concurrent illnesses and/or social issues will result in a substantive health burden in a population (Singer et al., 2017), and I inferred that such a population would report affected service use and service accessibility, given that illness severity is a known predictor of service use (Andersen & Newman, 1973; Robertson & Mosher-Ashley, 2002). To operationalize the rationale underlying this theory, the current study employed moderation analyses, where a significant interaction between FS status and racial/ethnic identity was indicative of differing trends in help-seeking behaviours or service accessibility, suggesting a possible syndemic. Overall, the results were not supportive of applying syndemic theory to the population of interest (i.e., Canadians who are food insecure and BIPOC), as indicated by the overall lack of statistically significant moderated effects.

Although I had a large *overall* sample, my primary analytical tool was logistic regression, which is extremely sensitive to group imbalance (e.g., number of members in racial/ethnic groups) as well as initial proportions (e.g., number of people who are White who indicate 0 and 1 on the binary outcome). Logistic models do well when the initial proportion is balanced (e.g., 0 = 50%, 1 = 50%), but power loss occurs rapidly as the proportion shies away from a 50/50 split. Granted, I had sufficient power to detect the *main* effects of interest for FI and race/ethnicity, but my ability to detect *moderated* effects was limited. For example, several of the interactions, such as the interaction between binary FS status and Latinx identity for experiencing a problematic wait time for an appointment (OR = 2.44), and the interaction between binary FS status and Arab identity for visiting a social worker or counsellor (OR = 5.53), had differences larger than OR = 1.44, but were still not statistically significant. It has been suggested that sample sizes for moderation analyses should be *at least* twice the size of the samples used to detect main effects, with even larger samples needed if only partial moderation is expected (Simonsohn, 2014). Additionally, because of the computation of pooled standard error in moderation models (Hayes & Agler, 2014), even if only one group reports a relatively small cell count, the error term will be sensitive to inflation. Further still, the current study could not employ bootstrap weights to reduce bias in error estimates, which likely made it more difficult for results to reach statistical significance. This failure, while not unexpected, illustrates the difficulty in conducting moderation research, even when using national datasets.

Overall, the results of the current study do not support syndemic theory in the context of race/ethnicity and FI, although this may be reflective of the specific outcomes, and is not necessarily a condemnation of the broader theory. The use of syndemic theory in informing my research question was not to explicitly test the theory, but rather to lend credence to *why* I would expect a moderating effect of race/ethnicity on FI. With that caveat, it *is* puzzling why larger or pronounced effects were not found, which is something I will briefly explore.

As discussed previously, there is a large amount of heterogeneity within the overarching BIPOC group (Selvarajah et al., 2020); however, there is also heterogeneity *within* each racial/ethnic group. People of the same race/ethnicity do not all share common life events or a common background: individuals have different experiences, relationships, and interactions (Harper & Nichols, 2008; Sue & Dhindsa, 2006). Although individual BIPOC groups do report differences related to social factors and health status when compared to people who are White, there is also substantial variation observed in the relative social context and overall health status of individuals *within* the same BIPOC groups (Sue & Dhindsa, 2006). Substantive within-group differences may conceal statistically significant effects (Selvarajah et al., 2020), which may account for why larger or pronounced effects were not detected in the current study.

Exploratory Analyses: Differences in Methods of Modelling Food Security Status

For exploratory purposes, the current study investigated differences in the relationships of interest when comparing two different methods of modelling FS status. Although FS status is thought to exist on a continuum (FAO, n.d.; Hendriks, 2015), it is rarely measured as such, and thus I was interested in comparing categorical and continuous conceptualizations of FI. The binary and linear measures of FS status demonstrated comparable direction of associations in all cases, although there were differences in statistical significance. For example, only linear FS status was significantly predictive of being hospitalized overnight, of having a regular care provider, and of visiting a psychiatrist. Additionally, only linear FS status demonstrated a statistically significant interaction with Latinx identity for number of ER visits; however, only binary FS status demonstrated statistically significant interactions between FI and Arab identity for visiting a mental health professional and for visiting a psychiatrist.

It is important to note that interpreting these findings to mean that one measure is necessarily a “better” conceptualization of FS status than the other is not warranted. Although a greater number of statistically significant findings may seem desirable, such findings are not indicative of whether one measure is a more accurate representation of the true FI-healthcare associations in the population. To truly compare the binary and linear measures of FS status, statistical comparison of model fit is needed. Typically, cross-model statistical comparisons are conducted by using Stata’s *test* command, following the use of the *suest* postestimation command; however, the *test* command can only compare the same variable across models (StataCorp, 2017). Although the two FS status measures were derived from the same 10 base variables, two unique variables were created that take on different methods of measurement. Because of this, Stata (and any other statistical program) does not recognize the binary and linear measures of FS status as being the same variable. Instead, they are viewed as two distinct variables, estimating unique parameters, and thus are not considered statistically comparable.

Although model fit comparisons were not possible, there were noticeable differences between the two conceptualizations of FS status that can be discussed. First, the two measures produced inherently different error terms. With the binary measure, all respondents were grouped together into two categories; but with the linear measure, groups were not created, and the raw score on the 11-point FS status scale was used. Therefore, the individual groups within the binary variable had a greater number of respondents than did any of the individual points in the linear measure, leading to reduced error terms for the binary variable, and making it easier for analyses using this measure to reach statistical significance. Nonetheless, there have been discussions in the literature as to whether dichotomizing linear variables is appropriate (Altman & Royston, 2006); given that the binary variable was created by dichotomizing a multi-point scale, this is potentially problematic. As a counterpoint, other fields may disagree with the notion that the FS status scale *is* a continuous variable: respondents' scores on the scale can only be expressed as whole numbers, so some may consider conceptualizing FS status as a discrete variable rather to be more appropriate (Mishra et al., 2018).

Second, there *was* an advantage to using the binary measure for obtaining pairwise comparisons. Although such comparisons could technically be carried out for both the binary and the linear measure, the latter produced issues due to low cell counts that prevented the release of these results, in following with Statistics Canada guidelines. Therefore, although the linear measure allowed for different levels of FI to be produced, depicting a better representation of the continuum of FS status as according to Hendriks (2015), definitive conclusions as to differences between racial/ethnic groups at different levels of FI could not be drawn due to this vetting issue. Although the FS measures could not be statistically compared, there appears to be at least some advantage to the binary conceptualization.

With that said, there is an inherent issue with treating FS status as a binary measure: in doing so, FI is treated as a standard experience across people who are food insecure, but there are thought to be various levels of FI that one can experience (Hendriks, 2015). Thus, treating individuals who are moderately food insecure as though they are comparable to individuals experiencing severe FI is likely not appropriate. Further, various associations involving FI have been shown to be dose-dependent, such as greater FI being associated with poorer mental health (Temple, 2008). It may be simpler from an analytical perspective to consider FS status as a dichotomy but doing so may mask the variability that exists in FS status and could affect how we understand FI and its associated effects.

Statistical Considerations

An important consideration when reviewing the results of the current study is in interpreting the effect sizes for the binary versus linear conceptualizations of FS status. Although readers may be tempted to compare these effects directly, the reported effect sizes for the linear measure of FS status depict the effect for *each* one-unit increase in the

11-point scale, and so comparing the group with the minimum score on the scale (i.e., food secure) to the group with the highest score (i.e., experiencing most severe form of FI) would need to be adjusted for each incremental step. As an example, consider the barrier to care outcome, skipping prescriptions due to cost: although the reported effect for each one-unit increase in the linear measure was of trivial size (OR = 1.29), the effect from comparing the group with the lowest level of FI to the highest level of FI was of a large size (OR = 12.76).

Readers are also reminded that the value and statistical significance of an interaction term only indicates whether the slope for the comparator group is statistically different from that of the reference group, and that these statistics are not indicative of the strength or direction of the association observed within the comparator group. Interpreting interactions via the plotted marginal estimates is the recommended approach for an easier interpretation (Greene, 2010). Therefore, readers are encouraged to focus on the figures to inform their understanding of moderated effects.

Limitations and Strengths

In interpreting the findings of the current study, readers should be aware of its limitations. First, there were several issues that arose due to low cell counts. From the 14 original racial/ethnic groups captured by the 2015-2016 CCHS, half the groups demonstrated extremely low cell counts. Due to concerns of having inadequate sample sizes to detect the associations of interest, prior to conducting analyses, I pooled numerous groups together to avoid potential power issues. Therefore, the current study was limited in terms of the number and specificity of racial/ethnic identities that could be examined. Additionally, despite these amalgamations, there were still unanticipated issues with low cell counts, resulting in an inability to apply bootstrap weights, as the number of unique sub-samples required to apply these weights could not be achieved for several analyses of interest. Therefore, error terms could not be adjusted, which likely resulted in inflated values, making it more difficult for results to reach statistical significance. Further still, there were certain models where data sparsity was too great to allow for analyses to be performed *at all*, as certain cells contained virtually no observations. Consequently, some of the outcomes I had planned to examine were omitted from the current study, such as visiting a nurse about mental health.

Second, the current study was limited by its use of archival data. Using pre-existing data limited the range of variables that I was able to explore, as well as the representativeness of my sample: questions inquiring about FS status were optional content in the 2015-2016 cycle, and because of this, these questions were excluded from surveys delivered in Ontario, Newfoundland and Labrador, and Yukon (Statistics Canada, 2017a). Consequently, the results of the current study cannot be generalized to individuals of these regions. Additionally, the data for this cycle was collected in 2015 and 2016, which may have affected its generalizability to the present day, given that it has been almost two years since the onset of the COVID-19 pandemic: in this time, rates of FI have increased (Polsky & Gilmour, 2020) and service delivery has been disrupted (Canadian Institute for Health Information, 2020).

Third, results may have been limited by the sampling frame of the CCHS. Data for this survey was not collected from Indigenous Peoples living on-reserve, nor from homeless individuals (Statistics Canada, 2017b). These are relevant restrictions: although the number of Indigenous Persons living on-reserve and the number of homeless

Canadians may be relatively small, these groups are highly vulnerable to FI (McKay et al., 2019). Not only is Indigenous status associated with greater risk of experiencing FI (Tarasuk et al., 2019), but Indigenous Peoples living on-reserve experience significantly higher rates of FI compared to individuals from the general Canadian population (Batal et al., 2021). Additionally, individuals lacking stable housing are more likely to report being food insecure compared to housed Canadians (O'Campo et al., 2017; Tarasuk et al., 2016; Weiser et al., 2009), and homeless populations are more likely to experience FI than housed individuals living in poverty (B. A. Lee & Greif, 2008). Therefore, the exclusion of Indigenous Peoples living on-reserve and of Canadians who are houseless from the CCHS sampling frame likely excluded a non-trivial number of individuals experiencing FI from the study sample, and likely also affects estimates of FI in Canada (Tarasuk et al., 2016).

Despite these limitations, the current study had several strengths. First, because data were obtained from Statistics Canada, this study had a provincially representative sample, and so results are generalizable to a broader population than what would have been possible had data been collected by the researchers. Second, despite the amalgamation of several racial/ethnic groups, the use of national survey data still allowed for a breadth of identities to be examined. Third, the current study was able to make several novel contributions to the current literature: this was the first study in the Canadian literature to examine racial/ethnic identity as a moderator in the relationships that FI demonstrates with healthcare use, barriers to care, and mental health service use, and with several novel relationships being detected.

Implications, Future Research Directions, and Conclusion

The purpose of the current study was to improve our understanding of the help-seeking behaviours of, and healthcare barriers faced by, Canadians that are food insecure and/or members of racialized groups. Specifically, the primary interest in the current work was to determine whether individuals who are both food insecure and BIPOC face worse access to care than Canadians who are food secure and/or White, and if their help-seeking behaviours differ from such individuals. Taken together, the results highlight several healthcare-related disparities faced by Canadians who are members of underrepresented groups, several disparities for Canadians experiencing FI, and select, multiplicative burdens faced by Canadians that are both BIPOC and food insecure. The data obtained from the current study can be used to inform Canadian healthcare policies, as well as poverty-related policies. These results have implications for the allocation of funding and other resources for medical and mental health services in Canada, as well as for community programs. Further, these results have potential implications for how services are advertised to target at-risk groups. Therefore, findings presented herein provide insight into potential areas within our healthcare system, and within our society, that can be changed to improve life for Canadians who are food insecure and/or BIPOC.

The current study makes headway for future research. As part of an exploratory analysis, results suggested that different methods of modelling FS status can affect the conclusions that we draw about relationships involving FI. Although the two conceptualizations could not be statistically compared, results of the current study indicated issues with data sparsity for the linear measure that were not observed with the binary measure, although this measure may have its own problems due to the heterogeneity of the groups that it creates. Further examination into methods of modelling FS status is needed if we are to understand how to best describe relationships involving FI, and the current study supports exploring non-continuous approaches to avoid any potential issues due to low cell counts. Such an exploration will involve selecting methods of measurement that are statistically appropriate and empirically validated, before conducting cross-model statistical comparisons.

Another potential avenue for future research is to examine sex-based differences in the relationships examined in the current study. Compared to their male counterparts, Canadians identifying as female are more likely to experience FI (Domingo et al., 2021), to experience discrimination (Nakhaie & Wijesingha, 2015), to face barriers to accessing care (Lai & Chau, 2007), and to use mental health services (Mackenzie et al., 2006). Sex was also a significant predictor in nearly all models. Therefore, a well-supported and potentially valuable area of study would be to examine the interrelationships between FI, race/ethnicity, and service use/access by sex. Identifying whether sex-based differences exist in these associations would be a novel and relevant contribution to the current literature with implications for policymaking.

Canadians who are food insecure and/or BIPOC are marginalized in society and face a wealth of social and health(care) inequalities. Until now, no study in the Canadian literature had examined whether race/ethnicity moderated the associations between FI and service use/accessibility. The current study adds to the literature in several ways. Results demonstrated that race/ethnicity was predictive of some of the outcomes, that FI was also predictive of some of the outcomes, and that race/ethnicity *sporadically* moderated a few of the FI-healthcare associations. Further, results demonstrated how different methods of modelling FS status at times affected the interpretations of these associations, which supports continued investigation into how FS status is best conceptualized for understanding service use/accessibility among Canadians reporting FI.

FI and racial/ethnic disparities are likely to remain prevalent in Canada for years to come. Continued investigation is required to understand exactly how FI and race/ethnicity relate independently to, and interact to influence, help-seeking behaviours and access to services. This continued investigation could bring attention to the trends in service use by Canadians who are food insecure and/or BIPOC, and how certain aspects of our current health system fail to address their needs. This enhanced exposure has implications for policymaking, as well as for the design and implementation of services and programs, all of which could improve the health and wellbeing of Canadians who are food insecure and/or BIPOC through addressing their use of, and access to, needed care.

Deviations From Research Proposal

Although the goals of the current study have remained consistent, there were some changes from the research proposal. Due to sparsity, a categorical measure of FS status was dropped, the racial/ethnic groups measured by the CCHS were amalgamated into broader categories, several outcomes were dropped (e.g., visiting a nurse about mental health), and bootstrap weights could not be applied. Further, results for a quadratic measure of FS status were omitted due to unreliable error estimates, and the method by which research questions and hypotheses were presented changed, strictly for narrative purposes.

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Table 1

Weighted Descriptive Statistics, Expressed as Either % or M/SD, for the Largest Overall Sample, by Racial/Ethnic Group.

	White	Indigenous	Asian	Black	Latinx	Arab	Other
	N = 50,300	*N* = 3,520	*N* = 3,510	*N* = 820	*N* = 520	*N* = 430	*N* = 530
Sex							
Female	49.52%	49.93%	49.57%	42.82%	51.14%	44.54%	46.49%
Male	50.48%	50.07%	50.43%	57.18%	48.86%	55.46%	53.51%
Education							
< high school	13.05%	20.42%	5.53%	5.63%[a]	7.11%[a]	5.42%[a]	7.32%[a]
High school	22.85%	28.24%	20.02%	17.86%	18.76%	18.79%[a]	25.31%
Post-secondary	64.10%	51.34%	74.45%	76.51%	74.13%	75.79%	67.37%
Marital status							
Married/Common law	64.61%	57.03%	64.10%	52.25%	66.03%	65.64%	59.65%
Wid./Sep./Div.	14.19%	11.82%	6.50%	9.82%[a]	11.33%	7.74%[a]	12.81%
Single	21.20%	31.15%	29.40%	37.93%	22.64%	26.62%	27.53%
Immigrant status							
Non-immigrant	90.06%	99.28%	18.40%	22.09%	13.27%[a]	14.03%[a]	32.76%
Immigrant	9.94%	0.72%	81.60%	77.91%	86.73%	85.97%	67.24%
Homeownership							
Renter	25.34%	40.01%	28.93%	55.36%	51.20%	54.17%	46.33%
Owner	74.66%	59.99%	71.07%	44.64%	48.80%	45.83%	53.67%
BMI							
Underweight	1.79%	2.82%	5.67%	0.93%[a]	4.03%[a]	2.75%[a]	2.84%[a]
Normal weight	41.96%	33.95%	56.46%	43.81%	46.21%	36.71%	45.07%
Overweight	35.07%	34.16%	30.17%	35.29%	33.13%	43.51%	35.93%
Obese	21.19%	29.06%	7.71%	19.97%	16.62%	17.03%[a]	16.16%
Smoker type							

	White	Indigenous	Asian	Black	Latinx	Arab	Other
	N = 50,300	*N* = 3,520	*N* = 3,510	*N* = 820	*N* = 520	*N* = 430	*N* = 530
Current smoker	19.24%	40.93%	11.33%	9.71%[a]	14.89%	22.12%	19.28%[a]
Former smoker	32.50%	26.51%	11.46%	7.75%[a]	18.01%	12.59%[a]	17.14%
Non-smoker	48.26%	32.56%	77.21%	82.53%	67.10%	65.28%	63.58%
Alcohol use							
Regular drinker	72.93%	63.58%	44.45%	50.72%	61.37%	31.28%	46.24%
Occasional drinker	13.41%	18.25%	20.48%	22.37%	22.63%	7.33%[a]	20.20%
Non-drinker	13.66%	18.17%	35.07%	26.91%	15.99%	61.39%	33.56%
Illicit drug use							
Non-drug user	88.32%	76.59%	95.45%	91.05%	90.47%	91.38%	93.41%
Drug user	11.68%	23.41%	4.55%	8.95%[a]	9.53%[a]	8.62%[a]	6.59%[a]
Hospitalized overnight?							
No	92.95%	91.38%	95.94%	93.73%	96.51%	92.90%	90.89%
Yes	7.05%	8.62%	4.06%	6.27%[a]	3.49%[a]	7.10%[a]	9.11%[a]
Age	49.44/17.25	41.97/15.81	41.24/15.24	39.40/14.81	40.35/13.30	39.01/12.55	43.83/16.37
Children <18	0.49/0.93	0.79/1.22	0.73/0.99	0.93/1.15	0.78/0.97	1.15/1.23	0.74/1.09
Household size	2.58/1.30	3.01/1.70	3.45/1.62	3.30/1.65	3.07/1.41	3.63/1.57	3.09/1.56
Income	10.38/34.77	8.68/7.98	9.70/10.01	8.38/13.52	7.60/6.88	7.37/6.78	8.26/7.50
FS status	0.35/1.31	1.15/2.38	0.29/1.00	0.72/1.70	0.43/1.14	0.50/1.30[a]	0.52/1.45[a]
Physical health	3.74/0.99	3.51/1.06	3.80/0.96	3.85/0.99	3.90/0.97	3.73/0.95	3.58/1.05
Mental health	4.00/0.93	3.75/1.05	4.01/0.93	4.20/0.89	4.11/0.87	4.07/0.92	3.92/1.03

Note. Descriptive statistics are not reported for the ‘region’ variable due to low cell counts in select cases; *N*s are randomly rounded in accordance with Statistics Canada vetting restrictions; Wid./Sep./Div. = widowed, separated, or divorced; BMI = body mass index; Income scaled by 10,000; FS status corresponds to the linear measure.

[a]Indicates that the coefficient of variation for the cell was greater than 0.15, but less than 0.35.

Table 2

Racial/Ethnic Identity as a Moderator of the Association Between Food Security (FS) Status and Having Been Hospitalized Overnight in the Previous 12 Months via Hierarchical Logistic Regression, for the Binary and Linear Measures of FS.

N = 59,630	Odds Ratio [95% Confidence Intervals]				
		Binary Model		Linear Model	
	Block 2	Block 3	Block 4	Block 5	Block 6
Constant	0.67 [0.42, 1.09]	0.60 [0.37, 0.97] *	0.60 [0.37, 0.98] *	0.60 [0.37, 0.97] *	0.60 [0.37, 0.98] *
Age	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]
Sex	0.67 [0.61, 0.75] ***	0.68 [0.61, 0.75] ***	0.68 [0.61, 0.75] ***	0.68 [0.61, 0.75] ***	0.67 [0.61, 0.75] ***
< high school (ref.)					
High school	0.95 [0.81, 1.11]	0.95 [0.81, 1.12]	0.95 [0.81, 1.11]	0.95 [0.81, 1.11]	0.95 [0.81, 1.11]
Post-secondary	1.03 [0.90, 1.17]	1.03 [0.90, 1.18]	1.03 [0.90, 1.18]	1.03 [0.90, 1.18]	1.03 [0.90, 1.17]
Mar./Com. law (ref.)					
Wid./Sep./Div.	1.02 [0.89, 1.17]	1.01 [0.88, 1.17]	1.01 [0.88, 1.16]	1.01 [0.88, 1.16]	1.01 [0.88, 1.16]
Single	0.78 [0.67, 0.92] **	0.78 [0.66, 0.92] **	0.78 [0.66, 0.92] **	0.78 [0.66, 0.92] **	0.78 [0.66, 0.92] **
Immigrant	0.71 [0.58, 0.87] **	0.71 [0.57, 0.87] **	0.71 [0.57, 0.87] **	0.71 [0.58, 0.88] **	0.71 [0.58, 0.88] **
Homeowner	0.95 [0.84, 1.08]	0.97 [0.86, 1.10]	0.98 [0.86, 1.11]	0.98 [0.86, 1.11]	0.98 [0.87, 1.11]
Physical health	0.62 [0.58, 0.66] ***	0.62 [0.59, 0.66] ***	0.62 [0.59, 0.66] ***	0.62 [0.59, 0.66] ***	0.62 [0.59, 0.66] ***
Mental health	1.03 [0.97, 1.08]	1.03 [0.98, 1.09]	1.03 [0.98, 1.09]	1.03 [0.98, 1.09]	1.04 [0.98, 1.09]
Normal weight (ref.)					
Underweight	1.12 [0.80, 1.57]	1.12 [0.80, 1.57]	1.12 [0.80, 1.57]	1.12 [0.80, 1.58]	1.12 [0.80, 1.58]
Overweight	0.97 [0.86, 1.09]	0.97 [0.86, 1.09]	0.97 [0.86, 1.09]	0.97 [0.86, 1.09]	0.97 [0.86, 1.09]
Obese	1.05 [0.92, 1.19]	1.04 [0.92, 1.18]	1.04 [0.92, 1.18]	1.04 [0.92, 1.18]	1.04 [0.92, 1.18]
Atlantic (ref.)					
Quebec	1.32 [1.14, 1.53] ***	1.33 [1.14, 1.54] ***	1.33 [1.14, 1.54] ***	1.33 [1.15, 1.55] ***	1.33 [1.15, 1.55] ***
Prairies	1.12 [0.97, 1.30]	1.13 [0.97, 1.31]	1.13 [0.97, 1.31]	1.13 [0.97, 1.31]	1.12 [0.97, 1.30]

N = 59,630	Odds Ratio [95% Confidence Intervals]				
		Binary Model		Linear Model	
	Block 2	Block 3	Block 4	Block 5	Block 6
British Columbia	1.04 [0.88, 1.24]	1.05 [0.88, 1.24]	1.05 [0.88, 1.25]	1.04 [0.88, 1.24]	1.05 [0.88, 1.24]
Territories	1.09 [0.76, 1.58]	1.08 [0.75, 1.56]	1.12 [0.79, 1.59]	1.07 [0.74, 1.55]	1.12 [0.78, 1.60]
Children <18	1.23 [1.10, 1.38] ***	1.23 [1.10, 1.38] ***	1.23 [1.10, 1.38] ***	1.23 [1.10, 1.38] ***	1.23 [1.10, 1.38] ***
Household size	0.97 [0.87, 1.07]	0.96 [0.87, 1.07]	0.96 [0.87, 1.07]	0.97 [0.87, 1.07]	0.97 [0.87, 1.07]
Income	0.99 [0.98, 1.00] **	0.99 [0.98, 1.00] **	0.99 [0.98, 1.00] **	0.99 [0.98, 1.00] **	0.99 [0.98, 1.00] **
White (ref.)					
Indigenous	1.05 [0.82, 1.35]	1.04 [0.81, 1.34]	1.11 [0.80, 1.55]	1.03 [0.80, 1.33]	1.11 [0.82, 1.50]
Asian	0.67 [0.50, 0.91] *	0.67 [0.50, 0.91] *	0.67 [0.48, 0.92] *	0.68 [0.50, 0.92] *	0.66 [0.48, 0.91] *
Black	0.97 [0.63, 1.51]	0.96 [0.62, 1.49]	1.08 [0.64, 1.83]	0.96 [0.62, 1.49]	1.06 [0.65, 1.73]
Latinx	0.56 [0.33, 0.94] *	0.55 [0.33, 0.93] *	0.40 [0.21, 0.76] **	0.56 [0.33, 0.94] *	0.46 [0.26, 0.83] *
Arab	0.84 [0.47, 1.51]	0.84 [0.47, 1.51]	0.72 [0.34, 1.53]	0.84 [0.47, 1.52]	0.77 [0.40, 1.51]
‘Other’	1.28 [0.77, 2.14]	1.28 [0.77, 2.14]	1.17 [0.65, 2.11] †	1.28 [0.77, 2.15]	1.32 [0.78, 2.25]
Binary FS status		1.18 [1.03, 1.36] *	1.17 [1.00, 1.37]		
Linear FS status				1.05 [1.02, 1.08] **	1.05 [1.02, 1.09] **
FS*White (ref.)					
FS*Indigenous			0.81 [0.51, 1.27]		0.95 [0.88, 1.02]
FS*Asian			1.10 [0.60, 2.02]		1.05 [0.90, 1.24]
FS*Black			0.66 [0.33, 1.34]		0.90 [0.77, 1.05]
FS*Latinx			2.62 [0.95, 7.26] †		1.23 [0.98, 1.55] †
FS*Arab			1.72 [0.63, 4.68]		1.12 [0.88, 1.43]
FS*‘Other’			1.44 [0.45, 4.58]		0.96 [0.77, 1.20]

Note. Block 1 omitted; Block 2 is identical for both models; Results for smoking status, alcohol use, and illicit drug use were omitted due to space constraints; Interaction terms correspond to method of modelling FS status, so these terms change when method of modeling changes (when model ‘resets’ between Blocks 4 and 5); Ref. = reference category; Mar./Com. law = Married or common-law; Wid./Sep./Div. = widowed, separated, or divorced; FS = food security.

† $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Table 3

Racial/Ethnic Identity as a Moderator of the Association Between Food Security (FS) Status and Number of Overnight Hospitalizations in the Previous 12 Months via Hierarchical Poisson Regression, for the Binary and Linear Measures of FS.

N = 59,580	Incidence Rate Ratio/SE				
		Binary Model		Linear Model	
	Block 2	Block 3	Block 4	Block 5	Block 6
Constant	5.32/3.66 *	5.30/4.09 *	5.32/4.15 *	4.91/3.72 *	4.80/3.68 *
Age	1.02/0.01 ***	1.02/0.01 **	1.02/0.01 **	1.02/0.01 ***	1.02/0.01 ***
Sex	1.13/0.15	1.13/0.15	1.12/0.14	1.13/0.15	1.12/0.14
< high school (ref.)					
High school	1.08/0.16	1.08/0.16	1.08/0.16	1.08/0.16	1.08/0.16
Post-secondary	1.41/0.28 †	1.41/0.28 †	1.41/0.28 †	1.41/0.28 †	1.41/0.28 †
Mar./Com. law (ref.)					
Wid./Sep./Div.	1.38/0.22 *	1.38/0.21 *	1.38/0.22 *	1.37/0.21 *	1.37/0.22 *
Single	0.85/0.16	0.85/0.16	0.85/0.16	0.84/0.16	0.85/0.16
Immigrant	0.48/0.19 †	0.48/0.19 †	0.48/0.19 †	0.48/0.19 †	0.48/0.19 †
Homeowner	0.68/0.16	0.68/0.17	0.69/0.17	0.69/0.17	0.70/0.17
Physical health	0.43/0.03 ***	0.43/0.04 ***	0.43/0.04 ***	0.43/0.04 ***	0.43/0.04 ***
Mental health	0.99/0.05	0.99/0.04	0.98/0.04	0.99/0.04	0.99/0.05
Normal weight (ref.)					
Underweight	1.28/0.28	1.28/0.28	1.28/0.28	1.29/0.28	1.29/0.28
Overweight	1.06/0.16	1.06/0.16	1.06/0.16	1.06/0.16	1.06/0.16
Obese	0.91/0.16	0.91/0.16	0.91/0.16	0.90/0.16	0.90/0.16
Atlantic (ref.)					
Quebec	0.95/0.33	0.95/0.34	0.96/0.34	0.96/0.34	0.97/0.34
Prairies	0.88/0.29	0.88/0.29	0.88/0.29	0.88/0.29	0.88/0.29

N = 59,580	Incidence Rate Ratio/SE				
		Binary Model		Linear Model	
	Block 2	Block 3	Block 4	Block 5	Block 6
British Columbia	0.87/0.32	0.87/0.33	0.87/0.33	0.87/0.32	0.88/0.33
Territories	0.80/0.34	0.80/0.34	0.82/0.35	0.80/0.34	0.83/0.36
Children <18	0.95/0.12	0.95/0.12	0.95/0.12	0.95/0.11	0.95/0.12
Household size	1.09/0.09	1.09/0.09	1.09/0.09	1.09/0.09	1.09/0.09
Income	0.98/0.01 †	0.98/0.01 †	0.98/0.01 *	0.98/0.01 †	0.98/0.01 †
White (ref.)					
Indigenous	0.72/0.13 †	0.71/0.13 †	0.76/0.18	0.71/0.13 †	0.79/0.17
Asian	0.73/0.30	0.73/0.30	0.62/0.24	0.74/0.30	0.65/0.26
Black	3.36/3.40	3.36/3.40	4.07/4.50	3.34/3.39	4.00/4.33
Latinx	0.74/0.50	0.73/0.05	0.87/0.72	0.73/0.50	0.90/0.69
Arab	0.78/0.38	0.78/0.38	0.46/0.23	0.78/0.38	0.73/0.37
‘Other’	0.55/0.23	0.55/0.24	0.56/0.28	0.55/0.24	0.55/0.26
Binary FS status		1.00/0.17	1.01/0.19		
Linear FS status				1.02/0.04	1.03/0.04
FS*White (ref.)					
FS*Indigenous			0.82/0.25		0.93/0.05
FS*Asian			2.29/1.18		1.17/0.14
FS*Black			0.38/0.37		0.79/0.17
FS*Latinx			0.59/0.52		0.77/0.20
FS*Arab			3.19/1.66 *		1.06/0.10
FS*‘Other’			0.95/0.60		1.01/0.13

Note. Block 1 omitted; Block 2 is identical for both models; Results for smoking status, alcohol use, and illicit drug use were omitted due to space constraints; Interaction terms correspond to method of modelling FS status, so these terms change when method of modeling changes (when model ‘resets’ between Blocks 4 and 5); Ref. = reference category; Mar./Com. law = Married or common-law; Wid./Sep./Div. = widowed, separated, or divorced; FS = food security.

† $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Table 4

Racial/Ethnic Identity as a Moderator of the Association Between Food Security (FS) Status and Number of Emergency Room Visits in the Previous 12 Months via Hierarchical Poisson Regression, for the Binary and Linear Measures of FS.

N = 59,590	Incidence Rate Ratio/Standard Error				
		Binary Model		Linear Model	
	Block 2	Block 3	Block 4	Block 5	Block 6
Constant	6.82/1.37 ***	4.89/0.94 ***	4.96/0.96 ***	4.65/0.88 ***	4.60/0.89 ***
Age	0.99/0.00 ***	0.99/0.00 ***	0.99/0.00 ***	0.99/0.00 ***	0.99/0.00 ***
Sex	0.86/0.04 **	0.87/0.04 **	0.87/0.04 **	0.87/0.04 **	0.87/0.04 **
< high school (ref.)					
High school	0.82/0.08 *	0.83/0.08 †	0.83/0.08 †	0.83/0.08 †	0.83/0.08 †
Post-secondary	0.82/0.08 *	0.84/0.08 †	0.84/0.08 †	0.84/0.08 *	0.84/0.08 *
Mar./Com. law (ref.)					
Wid./Sep./Div.	1.14/0.09	1.12/0.09	1.12/0.09	1.11/0.09	1.12/0.09
Single	1.01/0.08	1.00/0.08	1.00/0.08	0.99/0.08	1.00/0.08
Immigrant	0.78/0.04 ***	0.78/0.04 ***	0.78/0.04 ***	0.79/0.04 ***	0.79/0.04 ***
Homeowner	0.90/0.05 †	0.96/0.05	0.95/0.05	0.97/0.05	0.97/0.05
Physical health	0.66/0.01 ***	0.67/0.01 ***	0.67/0.01 ***	0.68/0.01 ***	0.68/0.01 ***
Mental health	0.94/0.03 †	0.96/0.03	0.96/0.03	0.97/0.03	0.97/0.03
Normal weight (ref.)					
Underweight	1.15/0.14	1.16/0.14	1.16/0.14	1.17/0.13	1.18/0.13
Overweight	1.01/0.05	1.01/0.05	1.01/0.05	1.01/0.05	1.01/0.05
Obese	1.17/0.08 *	1.15/0.08 *	1.15/0.08 *	1.16/0.08 *	1.16/0.08 *
Atlantic (ref.)					
Quebec	0.85/0.04 ***	0.86/0.04 **	0.86/0.04 **	0.86/0.04 **	0.86/0.04 **
Prairies	0.83/0.05 **	0.85/0.05 **	0.85/0.05 **	0.84/0.05 **	0.84/0.05 **

N = 59,590	Incidence Rate Ratio/Standard Error				
		Binary Model		Linear Model	
	Block 2	Block 3	Block 4	Block 5	Block 6
British Columbia	0.84/0.07 *	0.86/0.07 †	0.86/0.07 †	0.85/0.07 †	0.85/0.07 †
Territories	0.61/0.17 †	0.60/0.17 †	0.58/0.17 †	0.59/0.17 †	0.59/0.17 †
Children <18	0.99/0.05	0.98/0.05	0.98/0.05	0.98/0.05	0.98/0.05
Household size	1.03/0.05	1.04/0.05	1.04/0.05	1.04/0.05	1.04/0.05
Income	1.00/0.01	1.00/0.00	1.00/0.00	1.00/0.00	1.00/0.00
White (ref.)					
Indigenous	1.31/0.10 **	1.28/0.10 **	1.19/0.08 *	1.25/0.11 **	1.28/0.09 ***
Asian	0.57/0.05 ***	0.57/0.05 ***	0.60/0.06 ***	0.58/0.05 ***	0.58/0.05 ***
Black	1.20/0.23	1.16/0.22	1.01/0.17	1.17/0.22	1.10/0.16
Latinx	0.85/0.15	0.84/0.14	0.62/0.10 **	0.86/0.15	0.64/0.10 **
Arab	1.06/0.15	1.07/0.15	1.08/0.17	1.10/0.16	1.14/0.18
‘Other’	0.92/0.13	0.92/0.13	0.83/0.14	0.93/0.13	0.87/0.14
Binary FS status		1.50/0.11 ***	1.45/0.14 ***		
Linear FS status				1.10/0.02 ***	1.10/0.03 ***
FS*White (ref.)					
FS*Indigenous			1.17/0.20		0.99/0.03
FS*Asian			0.74/0.17		0.98/0.07
FS*Black			1.44/0.59		1.04/0.09
FS*Latinx			2.21/0.76 *		1.26/0.09 **
FS*Arab			1.00/0.30		0.94/0.07
FS*‘Other’			1.38/0.44		1.05/0.06

Note. Block 1 omitted; Block 2 is identical for both models; Results for smoking status, alcohol use, and illicit drug use were omitted due to space constraints; Interaction terms correspond to method of modelling FS status, so these terms change when method of modeling changes (when model ‘resets’ between Blocks 4 and 5); Ref. = reference category; Mar./Com. law = Married or common-law; Wid./Sep./Div. = widowed, separated, or divorced; FS = food security.

† p < .10, * p < .05, ** p < .01, *** p < .001

Table 5

Racial/Ethnic Identity as a Moderator of the Association Between Food Security (FS) Status and Number of Visits to a General Practitioner in the Previous 12 Months via Hierarchical Poisson Regression, for the Binary and Linear Measures of FS.

N = 59,380	Incidence Rate Ratio/Standard Error				
		Binary Model		Linear Model	
	Block 2	Block 3	Block 4	Block 5	Block 6
Constant	9.71/0.95 ***	8.83/0.92 ***	8.91/0.92 ***	8.60/0.88 ***	8.62/0.88 ***
Age	1.00/0.00 ***	1.00/0.00 ***	1.00/0.00 ***	1.00/0.00 ***	1.00/0.00 ***
Sex	0.76/0.01 ***	0.76/0.01 ***	0.76/0.01 ***	0.76/0.01 ***	0.76/0.01 ***
< high school (ref.)					
High school	1.04/0.04	1.04/0.04	1.04/0.04	1.04/0.04	1.04/0.04
Post-secondary	1.08/0.03 **	1.09/0.03 **	1.09/0.03 **	1.09/0.03 **	1.09/0.03 **
Mar./Com. law (ref.)					
Wid./Sep./Div.	0.94/0.02 *	0.94/0.02 **	0.94/0.02 *	0.93/0.02 **	0.93/0.02 **
Single	0.88/0.03 ***	0.87/0.03 ***	0.87/0.03 ***	0.87/0.03 ***	0.87/0.03 ***
Immigrant	0.94/0.03 *	0.94/0.03 *	0.94/0.03 *	0.94/0.03 *	0.94/0.03 *
Homeowner	0.96/0.02 †	0.98/0.02	0.98/0.02	0.98/0.02	0.98/0.02
Physical health	0.77/0.01 ***	0.77/0.01 ***	0.77/0.01 ***	0.77/0.01 ***	0.77/0.01 ***
Mental health	0.90/0.01 ***	0.91/0.01 ***	0.91/0.01 ***	0.91/0.01 ***	0.91/0.01 ***
Normal weight (ref.)					
Underweight	1.04/0.07	1.04/0.07	1.04/0.07	1.04/0.07	1.04/0.07
Overweight	1.04/0.02 †	1.04/0.02 †	1.04/0.02 †	1.04/0.02 †	1.04/0.02 †
Obese	1.14/0.03 ***	1.13/0.03 ***	1.14/0.03 ***	1.14/0.03 ***	1.14/0.03 ***
Atlantic (ref.)					
Quebec	0.59/0.02 ***	0.59/0.02 ***	0.59/0.02 ***	0.60/0.02 ***	0.60/0.02 ***
Prairies	1.02/0.03	1.02/0.03	1.02/0.03	1.02/0.03	1.02/0.03

N = 59,380	Incidence Rate Ratio/Standard Error				
		Binary Model		Linear Model	
	Block 2	Block 3	Block 4	Block 5	Block 6
British Columbia	1.20/0.04 ***	1.20/0.04 ***	1.21/0.04 ***	1.20/0.04 ***	1.20/0.04 ***
Territories	0.59/0.05 ***	0.59/0.05 ***	0.58/0.05 ***	0.59/0.05 ***	0.59/0.06 ***
Children <18	1.03/0.02 †	1.03/0.02	1.03/0.02	1.03/0.02	1.03/0.02
Household size	0.98/0.01 †	0.98/0.01 †	0.98/0.01 †	0.98/0.01	0.98/0.01
Income	1.00/0.00	1.00/0.00	1.00/0.00	1.00/0.00	1.00/0.00
White (ref.)					
Indigenous	1.03/0.05	1.02/0.05	0.98/0.05	1.01/0.05	1.01/0.05
Asian	0.99/0.04	0.99/0.04	0.98/0.04	1.00/0.04	0.98/0.04
Black	0.94/0.06	0.93/0.06	0.93/0.07	0.93/0.06	0.94/0.07
Latinx	0.89/0.07	0.89/0.07	0.88/0.07	0.90/0.07	0.91/0.07
Arab	0.98/0.10	0.98/0.10	0.97/0.11	0.99/0.10	0.93/0.11
‘Other’	0.90/0.09	0.89/0.09	0.88/0.08	0.90/0.09	0.91/0.09
Binary FS status		1.15/0.04 ***	1.12/0.04 ***		
Linear FS status				1.04/0.01 ***	1.04/0.01 ***
FS*White (ref.)					
FS*Indigenous			1.15/0.12		1.00/0.02
FS*Asian			1.10/0.15		1.03/0.03
FS*Black			1.02/0.15		1.00/0.03
FS*Latinx			1.07/0.20		0.97/0.05
FS*Arab			1.02/0.22		1.08/0.05
FS*‘Other’			1.08/0.34		0.97/0.04

Note. Block 1 omitted; Block 2 is identical for both models; Results for smoking status, alcohol use, and illicit drug use were omitted due to space constraints; Interaction terms correspond to method of modelling FS status, so these terms change when method of modeling changes (when model ‘resets’ between Blocks 4 and 5); Ref. = reference category; Mar./Com. law = Married or common-law; Wid./Sep./Div. = widowed, separated, or divorced; FS = food security.

† $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Table 6

Racial/Ethnic Identity as a Moderator of the Association Between Food Security (FS) Status and Number of Visits to a Medical Specialist in the Previous 12 Months via Hierarchical Poisson Regression, for the Binary and Linear Measures of FS.

N = 59,550	Incidence Rate Ratio/Standard Error				
		Binary Model		Linear Model	
	Block 2	Block 3	Block 4	Block 5	Block 6
Constant	8.53/1.90 ***	7.75/1.91 ***	7.67/1.93 ***	7.63/1.77 ***	7.59/1.77 ***
Age	0.99/0.00 ***	0.99/0.00 ***	0.99/0.00 ***	0.99/0.00 ***	0.99/0.00 ***
Sex	0.67/0.03 ***	0.67/0.03 ***	0.67/0.03 ***	0.67/0.03 ***	0.67/0.03 ***
< high school (ref.)					
High school	1.50/0.13 ***	1.50/0.13 ***	1.51/0.13 ***	1.50/0.13 ***	1.50/0.13 ***
Post-secondary	1.77/0.11 ***	1.78/0.11 ***	1.78/0.11 ***	1.78/0.11 ***	1.78/0.11 ***
Mar./Com. law (ref.)					
Wid./Sep./Div.	0.93/0.07	0.92/0.07	0.92/0.07	0.92/0.07	0.92/0.07
Single	0.91/0.07	0.91/0.07	0.91/0.07	0.91/0.07	0.91/0.07
Immigrant	0.95/0.11	0.95/0.11	0.95/0.11	0.95/0.11	0.95/0.11
Homeowner	1.01/0.06	1.03/0.07	1.03/0.07	1.03/0.07	1.03/0.07
Physical health	0.69/0.03 ***	0.69/0.03 ***	0.69/0.03 ***	0.69/0.03 ***	0.69/0.03 ***
Mental health	0.88/0.02 ***	0.88/0.02 ***	0.88/0.02 ***	0.88/0.02 ***	0.88/0.02 ***
Normal weight (ref.)					
Underweight	0.83/0.11	0.83/0.11	0.83/0.11	0.83/0.11	0.83/0.11
Overweight	0.98/0.06	0.98/0.06	0.98/0.06	0.98/0.06	0.98/0.06
Obese	0.94/0.06	0.94/0.06	0.94/0.06	0.94/0.06	0.94/0.06
Atlantic (ref.)					
Quebec	1.13/0.06 *	1.13/0.07 *	1.14/0.07 *	1.14/0.06 *	1.14/0.06 *
Prairies	1.13/0.07 †	1.14/0.07 *	1.14/0.07 *	1.14/0.07 *	1.13/0.07 *

N = 59,550	Incidence Rate Ratio/Standard Error				
		Binary Model		Linear Model	
	Block 2	Block 3	Block 4	Block 5	Block 6
British Columbia	1.37/0.10 ***	1.38/0.10 ***	1.38/0.10 ***	1.38/0.10 ***	1.38/0.10 ***
Territories	0.63/0.11 **	0.63/0.11 **	0.64/0.11 **	0.62/0.11 **	0.63/0.11 **
Children <18	1.05/0.06	1.04/0.06	1.04/0.06	1.04/0.06	1.04/0.06
Household size	0.93/0.04	0.94/0.04	0.94/0.04	0.94/0.04	0.94/0.04
Income	1.00/0.00	1.00/0.00	1.00/0.00	1.00/0.00	1.00/0.00
White (ref.)					
Indigenous	0.83/0.10	0.82/0.10 †	0.85/0.13	0.82/0.10 †	0.84/0.11
Asian	0.61/0.09 **	0.61/0.09 **	0.62/0.09 **	0.61/0.09 **	0.61/0.09 **
Black	0.78/0.18	0.77/0.18	0.86/0.25	0.77/0.18	0.84/0.22
Latinx	0.60/0.10 **	0.60/0.10 **	0.62/0.11 **	0.60/0.10 **	0.62/0.11 **
Arab	0.56/0.10 **	0.55/0.10 **	0.58/0.11 **	0.56/0.10 **	0.57/0.11 **
‘Other’	0.94/0.26	0.94/0.26	0.88/0.27	0.95/0.26	0.90/0.26
Binary FS status		1.15/0.12	1.18/0.15		
Linear FS status				1.04/0.02 *	1.04/0.02 *
FS*White (ref.)					
FS*Indigenous			0.88/0.20		0.98/0.04
FS*Asian			0.92/0.25		1.03/0.09
FS*Black			0.65/0.24		0.92/0.07
FS*Latinx			0.85/0.28		0.95/0.09
FS*Arab			0.80/0.27		0.96/0.08
FS*‘Other’			1.30/0.77		1.05/0.09

Note. Block 1 omitted; Block 2 is identical for both models; Results for smoking status, alcohol use, and illicit drug use were omitted due to space constraints; Interaction terms correspond to method of modelling FS status, so these terms change when method of modeling changes (when model ‘resets’ between Blocks 4 and 5); Ref. = reference category; Mar./Com. law = Married or common-law; Wid./Sep./Div. = widowed, separated, or divorced; FS = food security.

† p < .10, * p < .05, ** p < .01, *** p < .001

Table 7

Racial/Ethnic Identity as a Moderator of the Association Between Food Security (FS) Status and Number of Visits to a Nurse in the Previous 12 Months via Hierarchical Poisson Regression, for the Binary and Linear Measures of FS.

N = 59,490	Incidence Rate Ratio/SE				
		Binary Model		Linear Model	
	Block 2	Block 3	Block 4	Block 5	Block 6
Constant	3.86/1.42 ***	3.11/1.17 **	3.14/1.14 **	3.15/1.12 **	3.07/1.08 **
Age	1.00/0.00	1.01/0.00	1.01/0.00	1.01/0.00	1.01/0.00
Sex	0.76/0.07 **	0.77/0.07 **	0.77/0.07 **	0.76/0.07 **	0.76/0.07 **
< high school (ref.)					
High school	1.00/0.15	1.01/0.15	1.01/0.15	1.00/0.15	1.01/0.15
Post-secondary	1.14/0.14	1.15/0.14	1.15/0.14	1.14/0.14	1.14/0.14
Mar./Com. law (ref.)					
Wid./Sep./Div.	1.28/0.15 *	1.26/0.15 †	1.26/0.15 †	1.26/0.15 †	1.26/0.15 †
Single	1.38/0.17 **	1.37/0.17 *	1.36/0.17 *	1.37/0.17 *	1.36/0.17 *
Immigrant	0.52/0.10 **	0.52/0.10 **	0.52/0.10 **	0.53/0.10 **	0.52/0.10 **
Homeowner	0.77/0.09 *	0.80/0.09 *	0.80/0.09 *	0.80/0.09 *	0.80/0.09 †
Physical health	0.59/0.03 ***	0.59/0.03 ***	0.59/0.03 ***	0.59/0.03 ***	0.60/0.03 ***
Mental health	0.92/0.05	0.93/0.05	0.93/0.05	0.93/0.05	0.94/0.05
Normal weight (ref.)					
Underweight	0.84/0.16	0.84/0.17	0.84/0.17	0.85/0.17	0.84/0.16
Overweight	1.07/0.12	1.07/0.12	1.08/0.12	1.08/0.12	1.07/0.12
Obese	1.22/0.14 †	1.21/0.14 †	1.22/0.14 †	1.22/0.14 †	1.21/0.14 †
Atlantic (ref.)					
Quebec	1.65/0.16 ***	1.67/0.16 ***	1.67/0.17 ***	1.67/0.17 ***	1.68/0.17 ***
Prairies	1.36/0.15 **	1.37/0.16 **	1.38/0.16 **	1.37/0.15 **	1.37/0.15 **

N = 59,490	Incidence Rate Ratio/SE				
		Binary Model		Linear Model	
	Block 2	Block 3	Block 4	Block 5	Block 6
British Columbia	1.05/0.18	1.06/0.18	1.06/0.18	1.06/0.18	1.05/0.18
Territories	2.40/0.54 ***	2.38/0.54 ***	2.27/0.60 **	2.36/0.54 ***	2.44/0.55 ***
Children <18	1.08/0.11	1.07/0.10	1.07/0.10	1.07/0.10	1.07/0.10
Household size	1.00/0.06	1.01/0.06	1.01/0.06	1.01/0.06	1.01/0.06
Income	1.00/0.00	1.00/0.00	1.00/0.00	1.00/0.00	1.00/0.00
White (ref.)					
Indigenous	1.21/0.32	1.19/0.31	1.02/0.18	1.18/0.31	1.28/0.33
Asian	0.70/0.16	0.71/0.16	0.71/0.18	0.71/0.16	0.75/0.18
Black	1.96/0.96	1.92/0.94	1.73/0.83	1.93/0.95	2.14/1.01
Latinx	1.37/0.66	1.34/0.65	1.62/0.90	1.37/0.66	1.34/0.78
Arab	0.83/0.28	0.84/0.29	0.97/0.36	0.85/0.29	0.94/0.33
‘Other’	0.70/0.33	0.70/0.33	0.89/0.45	0.71/0.33	0.86/0.44
Binary FS status		1.30/0.17 *	1.28/0.18 †		
Linear FS status				1.05/0.03 *	1.07/0.03 *
FS*White (ref.)					
FS*Indigenous			1.42/0.67		0.95/0.04
FS*Asian			0.96/0.33		0.91/0.07
FS*Black			1.31/1.19		0.91/0.09
FS*Latinx			0.49/0.42		1.02/0.22
FS*Arab			0.47/0.29		0.85/0.17
FS*‘Other’			0.25/0.18 †		0.74/0.13 †

Note. Block 1 omitted; Block 2 is identical for both models; Results for smoking status, alcohol use, and illicit drug use were omitted due to space constraints; Interaction terms correspond to method of modelling FS status, so these terms change when method of modeling changes (when model ‘resets’ between Blocks 4 and 5); Ref. = reference category; Mar./Com. law = Married or common-law; Wid./Sep./Div. = widowed, separated, or divorced; FS = food security.

† $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Table 8

Racial/Ethnic Identity as a Moderator of the Association Between Food Security (FS) Status and Having a Source for Immediate Care for a Minor Health Problem via Hierarchical Logistic Regression, for the Binary and Linear Measures of FS.

N = 59,550	Odds Ratio [95% Confidence Intervals]				
		Binary Model		Linear Model	
	Block 2	Block 3	Block 4	Block 5	Block 6
Constant	4.28 [2.93, 6.26] ***	4.25 [2.89, 6.23] ***	4.29 [2.92, 6.31] ***	4.50 [3.06, 6.62] ***	4.51 [3.06, 6.65] ***
Age	1.01 [1.01, 1.02] ***	1.01 [1.01, 1.02] ***	1.01 [1.01, 1.02] ***	1.01 [1.01, 1.02] ***	1.01 [1.01, 1.02] ***
Sex	0.57 [0.53, 0.63] ***	0.57 [0.53, 0.63] ***	0.57 [0.53, 0.63] ***	0.57 [0.52, 0.62] ***	0.57 [0.52, 0.62] ***
< high school (ref.)					
High school	1.29 [1.12, 1.48] ***	1.29 [1.12, 1.48] ***	1.29 [1.12, 1.48] ***	1.29 [1.12, 1.48] ***	1.28 [1.12, 1.48] ***
Post-secondary	1.29 [1.14, 1.45] ***	1.29 [1.14, 1.45] ***	1.29 [1.14, 1.45] ***	1.28 [1.13, 1.45] ***	1.28 [1.13, 1.45] ***
Mar./Com. law (ref.)					
Wid./Sep./Div.	0.83 [0.74, 0.94] **	0.83 [0.74, 0.94] **	0.83 [0.74, 0.94] **	0.83 [0.74, 0.94] **	0.83 [0.74, 0.94] **
Single	0.76 [0.67, 0.85] ***	0.76 [0.67, 0.85] ***	0.76 [0.68, 0.85] ***	0.76 [0.67, 0.85] ***	0.76 [0.68, 0.85] ***
Immigrant	0.75 [0.65, 0.87] ***	0.75 [0.65, 0.87] ***	0.75 [0.65, 0.86] ***	0.75 [0.65, 0.86] ***	0.75 [0.65, 0.86] ***
Homeowner	1.27 [1.14, 1.41] ***	1.27 [1.15, 1.41] ***	1.27 [1.15, 1.41] ***	1.26 [1.13, 1.40] ***	1.26 [1.13, 1.40] ***
Physical health	0.93 [0.89, 0.98] *	0.93 [0.89, 0.99] *	0.93 [0.89, 0.98] *	0.93 [0.88, 0.98] **	0.93 [0.88, 0.98] **
Mental health	1.04 [0.98, 1.09]	1.04 [0.98, 1.09]	1.04 [0.98, 1.09]	1.03 [0.98, 1.09]	1.03 [0.98, 1.09]
Normal weight (ref.)					
Underweight	0.68 [0.51, 0.89] **	0.68 [0.51, 0.89] **	0.68 [0.51, 0.89] **	0.68 [0.51, 0.89] **	0.68 [0.51, 0.89] **
Overweight	1.10 [1.00, 1.21] †	1.10 [1.00, 1.21] †	1.10 [1.00, 1.21] †	1.10 [1.00, 1.21] †	1.10 [1.00, 1.21] †
Obese	1.31 [1.17, 1.46] ***	1.31 [1.17, 1.46] ***	1.31 [1.17, 1.47] ***	1.31 [1.17, 1.47] ***	1.31 [1.17, 1.47] ***
Atlantic (ref.)					
Quebec	0.58 [0.50, 0.66] ***	0.58 [0.50, 0.66] ***	0.58 [0.50, 0.66] ***	0.57 [0.50, 0.66] ***	0.57 [0.50, 0.66] ***
Prairies	0.98 [0.84, 1.14]	0.98 [0.84, 1.14]	0.98 [0.84, 1.13]	0.98 [0.84, 1.13]	0.98 [0.84, 1.13]

N = 59,550	Odds Ratio [95% Confidence Intervals]				
		Binary Model		Linear Model	
	Block 2	Block 3	Block 4	Block 5	Block 6
British Columbia	1.07 [0.91, 1.25]	1.07 [0.91, 1.25]	1.07 [0.91, 1.26]	1.07 [0.91, 1.25]	1.07 [0.91, 1.25]
Territories	0.98 [0.71, 1.34]	0.98 [0.71, 1.34]	0.94 [0.69, 1.29]	0.99 [0.72, 1.35]	1.00 [0.73, 1.37]
Children <18	1.06 [0.98, 1.15]	1.06 [0.98, 1.15]	1.06 [0.98, 1.15]	1.06 [0.98, 1.15]	1.06 [0.98, 1.15]
Household size	1.06 [1.00, 1.13] †	1.06 [1.00, 1.13] †	1.06 [1.00, 1.13] †	1.06 [1.00, 1.13] †	1.06 [1.00, 1.13] †
Income	1.01 [1.00, 1.02] *	1.01 [1.00, 1.02] *	1.01 [1.00, 1.02] *	1.01 [1, 1.01] †	1.01 [1.00, 1.01] †
White (ref.)					
Indigenous	1.05 [0.85, 1.30]	1.05 [0.84, 1.30]	0.98 [0.76, 1.27]	1.06 [0.85, 1.31]	1.07 [0.83, 1.38]
Asian	0.99 [0.81, 1.20]	0.99 [0.81, 1.20]	0.99 [0.81, 1.22]	0.98 [0.81, 1.2]	0.97 [0.79, 1.18]
Black	0.93 [0.65, 1.31]	0.92 [0.65, 1.31]	0.91 [0.60, 1.39]	0.93 [0.66, 1.32]	0.87 [0.59, 1.27]
Latinx	1.27 [0.87, 1.86]	1.27 [0.87, 1.86]	1.12 [0.74, 1.70]	1.27 [0.87, 1.86]	1.25 [0.82, 1.90]
Arab	0.92 [0.62, 1.36]	0.92 [0.62, 1.36]	0.86 [0.57, 1.31]	0.92 [0.62, 1.35]	0.88 [0.58, 1.31]
‘Other’	0.89 [0.62, 1.26]	0.89 [0.62, 1.26]	0.95 [0.64, 1.40]	0.88 [0.62, 1.26]	0.90 [0.62, 1.30]
Binary FS status		1.01 [0.89, 1.15]	0.98 [0.85, 1.13]		
Linear FS status				0.98 [0.95, 1.01]	0.97 [0.94, 1.01]
FS*White (ref.)					
FS*Indigenous			1.28 [0.84, 1.93]		0.99 [0.92, 1.07]
FS*Asian			0.96 [0.63, 1.46]		1.06 [0.94, 1.19]
FS*Black			1.07 [0.55, 2.08]		1.11 [0.95, 1.30]
FS*Latinx			2.25 [0.92, 5.51] †		1.05 [0.78, 1.40]
FS*Arab			1.46 [0.57, 3.79]		1.12 [0.83, 1.51]
FS*‘Other’			0.72 [0.31, 1.69]		0.98 [0.75, 1.27]

Note. Block 1 omitted; Block 2 is identical for both models; Results for smoking status, alcohol use, and illicit drug use were omitted due to space constraints; Interaction terms correspond to method of modelling FS status, so these terms change when method of modeling changes (when model ‘resets’ between Blocks 4 and 5); Ref. = reference category; Mar./Com. law = Married or common-law; Wid./Sep./Div. = widowed, separated, or divorced; FS = food security.

† $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Table 9

Racial/Ethnic Identity as a Moderator of the Association Between Food Security (FS) Status and Having a Regular Care Provider via Hierarchical Logistic Regression, for the Both Binary and Linear Measures of FS.

N = 59,620	Odds Ratio [95% Confidence Intervals]				
		Binary Model		Linear Model	
	Block 2	Block 3	Block 4	Block 5	Block 6
Constant	2.51 [1.78, 3.54] ***	2.73 [1.91, 3.90] ***	2.69 [1.89, 3.83] ***	2.79 [1.96, 3.98] ***	2.80 [1.96, 3.98] ***
Age	1.03 [1.03, 1.04] ***	1.03 [1.03, 1.04] ***	1.03 [1.03, 1.04] ***	1.03 [1.03, 1.04] ***	1.03 [1.03, 1.04] ***
Sex	0.52 [0.48, 0.56] ***	0.52 [0.48, 0.56] ***	0.52 [0.48, 0.56] ***	0.52 [0.48, 0.56] ***	0.52 [0.48, 0.56] ***
< high school (ref.)					
High school	1.19 [1.05, 1.35] **	1.18 [1.04, 1.35] *	1.18 [1.04, 1.35] *	1.18 [1.04, 1.35] *	1.18 [1.04, 1.34] *
Post-secondary	1.17 [1.04, 1.31] **	1.16 [1.03, 1.30] *	1.16 [1.04, 1.30] *	1.16 [1.03, 1.30] *	1.16 [1.03, 1.30] *
Mar./Com. law (ref.)					
Wid./Sep./Div.	0.86 [0.77, 0.96] **	0.86 [0.77, 0.97] *	0.86 [0.77, 0.97] *	0.87 [0.77, 0.97] *	0.87 [0.77, 0.97] *
Single	0.75 [0.67, 0.83] ***	0.75 [0.68, 0.83] ***	0.75 [0.68, 0.83] ***	0.75 [0.68, 0.83] ***	0.75 [0.68, 0.83] ***
Immigrant	0.67 [0.59, 0.76] ***	0.67 [0.59, 0.76] ***	0.67 [0.59, 0.77] ***	0.67 [0.59, 0.76] ***	0.67 [0.59, 0.76] ***
Homeowner	1.66 [1.52, 1.82] ***	1.64 [1.50, 1.79] ***	1.64 [1.50, 1.79] ***	1.63 [1.49, 1.79] ***	1.63 [1.49, 1.79] ***
Physical health	0.87 [0.83, 0.91] ***	0.86 [0.83, 0.90] ***	0.87 [0.83, 0.91] ***	0.86 [0.83, 0.90] ***	0.86 [0.83, 0.90] ***
Mental health	1.01 [0.96, 1.05]	1.00 [0.95, 1.05]	1.00 [0.95, 1.05]	1.00 [0.95, 1.04]	1.00 [0.95, 1.04]
Normal weight (ref.)					
Underweight	0.85 [0.66, 1.08]	0.85 [0.66, 1.08]	0.85 [0.66, 1.08]	0.85 [0.66, 1.08]	0.84 [0.66, 1.08]
Overweight	1.06 [0.97, 1.15]	1.06 [0.97, 1.15]	1.06 [0.97, 1.15]	1.06 [0.97, 1.15]	1.06 [0.97, 1.15]
Obese	1.22 [1.10, 1.35] ***	1.22 [1.10, 1.36] ***	1.22 [1.10, 1.36] ***	1.22 [1.10, 1.36] ***	1.22 [1.10, 1.36] ***
Atlantic (ref.)					
Quebec	0.36 [0.31, 0.41] ***	0.36 [0.31, 0.41] ***	0.36 [0.31, 0.41] ***	0.36 [0.31, 0.41] ***	0.36 [0.31, 0.41] ***
Prairies	0.61 [0.53, 0.70] ***	0.61 [0.53, 0.69] ***	0.61 [0.53, 0.70] ***	0.61 [0.53, 0.69] ***	0.61 [0.53, 0.69] ***

N = 59,620	Odds Ratio [95% Confidence Intervals]				
		Binary Model		Linear Model	
	Block 2	Block 3	Block 4	Block 5	Block 6
British Columbia	0.68 [0.58, 0.78] ***	0.67 [0.58, 0.78] ***	0.67 [0.58, 0.78] ***	0.67 [0.58, 0.78] ***	0.67 [0.58, 0.78] ***
Territories	0.08 [0.06, 0.10] ***	0.08 [0.06, 0.10] ***	0.08 [0.06, 0.10] ***	0.08 [0.06, 0.10] ***	0.08 [0.06, 0.10] ***
Children <18	0.99 [0.93, 1.06]	1.00 [0.93, 1.07]	1.00 [0.93, 1.07]	1.00 [0.93, 1.07]	1.00 [0.93, 1.07]
Household size	1.09 [1.03, 1.15] **	1.08 [1.03, 1.14] **	1.09 [1.03, 1.15] **	1.08 [1.03, 1.14] **	1.08 [1.03, 1.14] **
Income	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]
White (ref.)					
Indigenous	0.92 [0.78, 1.09]	0.93 [0.79, 1.10]	0.96 [0.79, 1.17]	0.94 [0.79, 1.11]	0.96 [0.80, 1.16]
Asian	1.13 [0.95, 1.35]	1.13 [0.95, 1.35]	1.14 [0.95, 1.37]	1.13 [0.94, 1.35]	1.14 [0.95, 1.36]
Black	0.70 [0.54, 0.92] *	0.71 [0.54, 0.93] *	0.72 [0.53, 0.99] *	0.71 [0.54, 0.93] *	0.71 [0.53, 0.96] *
Latinx	0.96 [0.70, 1.32]	0.97 [0.71, 1.32]	1.00 [0.70, 1.43]	0.96 [0.70, 1.32]	0.99 [0.70, 1.39]
Arab	0.53 [0.38, 0.75] ***	0.53 [0.38, 0.75] ***	0.56 [0.38, 0.82] **	0.53 [0.37, 0.75] ***	0.50 [0.35, 0.73] ***
‘Other’	0.90 [0.63, 1.30]	0.91 [0.63, 1.30]	0.98 [0.67, 1.45]	0.90 [0.63, 1.29]	1.00 [0.68, 1.46]
Binary FS status		0.88 [0.78, 0.99] *	0.92 [0.80, 1.05]		
Linear FS status				0.96 [0.94, 0.99] **	0.97 [0.94, 1.00] *
FS*White (ref.)					
FS*Indigenous			0.90 [0.63, 1.27]		0.98 [0.92, 1.04]
FS*Asian			0.95 [0.61, 1.47]		0.98 [0.87, 1.11]
FS*Black			0.93 [0.54, 1.62]		1.00 [0.88, 1.13]
FS*Latinx			0.83 [0.44, 1.57]		0.94 [0.77, 1.14]
FS*Arab			0.77 [0.35, 1.72]		1.11 [0.89, 1.38]
FS*‘Other’			0.65 [0.25, 1.71]		0.85 [0.71, 1.01] †

Note. Block 1 omitted; Block 2 is identical for both models; Results for smoking status, alcohol use, and illicit drug use were omitted due to space constraints; Interaction terms correspond to method of modelling FS status, so these terms change when method of modeling changes (when model ‘resets’ between Blocks 4 and 5); Ref. = reference category; Mar./Com. law = Married or common-law; Wid./Sep./Div. = widowed, separated, or divorced; FS = food security.

† $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Table 10

Racial/Ethnic Identity as a Moderator of the Association Between Food Security (FS) Status and Experiencing a Problematic Wait Time for Getting an Appointment via Hierarchical Logistic Regression, for the Binary and Linear Measures of FS.

N = 32,850	Odds Ratio [95% Confidence Intervals]				
		Binary Model		Linear Model	
	Block 2	Block 3	Block 4	Block 5	Block 6
Constant	0.98 [0.57, 1.67]	0.88 [0.51, 1.50]	0.59 [0.34, 1.03] †	0.64 [0.37, 1.11]	0.65 [0.37, 1.13]
Age	0.99 [0.98, 0.99] ***	0.99 [0.98, 0.99] ***	0.99 [0.98, 0.99] ***	0.99 [0.98, 0.99] ***	0.99 [0.98, 0.99] ***
Sex	0.94 [0.84, 1.07]	0.92 [0.82, 1.04]	0.93 [0.82, 1.05]	0.93 [0.82, 1.05]	0.92 [0.82, 1.04]
< high school (ref.)					
High school	0.97 [0.79, 1.18]	0.96 [0.79, 1.17]	0.98 [0.81, 1.20]	0.99 [0.81, 1.20]	0.98 [0.81, 1.20]
Post-secondary	1.16 [0.97, 1.38] †	1.14 [0.96, 1.35]	1.18 [0.99, 1.40] †	1.16 [0.98, 1.38] †	1.16 [0.97, 1.38]
Mar./Com. law (ref.)					
Wid./Sep./Div.	0.86 [0.72, 1.03] †	0.85 [0.72, 1.02] †	0.82 [0.69, 0.98] *	0.82 [0.69, 0.98] *	0.83 [0.69, 0.99] *
Single	0.79 [0.66, 0.95] *	0.77 [0.64, 0.93] **	0.75 [0.63, 0.90] **	0.76 [0.63, 0.91] **	0.76 [0.63, 0.91] **
Immigrant	1.52 [1.31, 1.77] ***	1.13 [0.93, 1.37]	1.13 [0.94, 1.37]	1.14 [0.94, 1.38]	1.15 [0.95, 1.39]
Homeowner	0.84 [0.72, 0.97] *	0.83 [0.72, 0.96] *	0.89 [0.77, 1.03]	0.88 [0.76, 1.02] †	0.89 [0.77, 1.02]
Physical health	0.84 [0.79, 0.90] ***	0.85 [0.79, 0.91] ***	0.86 [0.80, 0.92] ***	0.86 [0.80, 0.92] ***	0.86 [0.80, 0.92] ***
Mental health	0.86 [0.80, 0.92] ***	0.86 [0.80, 0.92] ***	0.88 [0.82, 0.94] ***	0.88 [0.82, 0.94] ***	0.88 [0.82, 0.94] ***
Normal weight (ref.)					
Underweight	1.00 [0.67, 1.50]	1.01 [0.68, 1.49]	1.00 [0.67, 1.49]	1.02 [0.68, 1.51]	1.01 [0.68, 1.51]
Overweight	1.04 [0.91, 1.19]	1.06 [0.93, 1.21]	1.06 [0.93, 1.21]	1.06 [0.93, 1.21]	1.06 [0.93, 1.21]
Obese	0.90 [0.76, 1.06]	0.94 [0.79, 1.11]	0.92 [0.77, 1.08]	0.92 [0.78, 1.09]	0.92 [0.78, 1.09]
Atlantic (ref.)					
Quebec	1.00 [0.82, 1.22]	1.00 [0.82, 1.22]	1.03 [0.85, 1.26]	1.03 [0.85, 1.26]	1.03 [0.85, 1.26]
Prairies	1.02 [0.84, 1.23]	0.99 [0.82, 1.20]	1.01 [0.83, 1.22]	1.00 [0.83, 1.22]	1.00 [0.82, 1.21]

N = 32,850	Odds Ratio [95% Confidence Intervals]				
		Binary Model		Linear Model	
	Block 2	Block 3	Block 4	Block 5	Block 6
British Columbia	1.12 [0.91, 1.37]	1.04 [0.85, 1.28]	1.06 [0.87, 1.30]	1.05 [0.86, 1.30]	1.05 [0.86, 1.29]
Territories	1.94 [1.39, 2.70] ***	1.83 [1.29, 2.58] **	1.79 [1.26, 2.53] **	1.79 [1.26, 2.55] **	1.80 [1.26, 2.57] **
Children <18	1.15 [1.03, 1.28] *	1.17 [1.05, 1.31] **	1.16 [1.04, 1.29] **	1.16 [1.04, 1.30] **	1.16 [1.04, 1.30] **
Household size	0.94 [0.86, 1.04]	0.92 [0.84, 1.01] †	0.92 [0.84, 1.01] †	0.92 [0.84, 1.01] †	0.92 [0.84, 1.01] †
Income	0.99 [0.98, 1.00] *	0.99 [0.98, 1.00] †	0.99 [0.99, 1.00]	0.99 [0.99, 1.00]	0.99 [0.99, 1.00]
White (ref.)					
Indigenous	1.14 [0.91, 1.43]	1.08 [0.86, 1.36]	1.08 [0.82, 1.43]	1.07 [0.85, 1.35]	1.10 [0.85, 1.42]
Asian	2.01 [1.58, 2.55] ***	2.00 [1.57, 2.54] ***	2.04 [1.58, 2.62] ***	2.04 [1.60, 2.59] ***	1.99 [1.55, 2.55] ***
Black	1.78 [1.10, 2.89] *	1.69 [1.04, 2.75] *	2.00 [1.15, 3.48] *	1.74 [1.07, 2.83] *	1.96 [1.15, 3.34] *
Latinx	0.98 [0.60, 1.61]	0.95 [0.59, 1.55]	0.72 [0.40, 1.28]	0.98 [0.60, 1.61]	0.87 [0.52, 1.44]
Arab	1.71 [0.97, 3.02] †	1.68 [0.95, 2.95] †	1.47 [0.75, 2.91]	1.72 [0.98, 3.01] †	1.43 [0.75, 2.72]
'Other'	1.34 [0.84, 2.13]	1.33 [0.83, 2.12]	1.36 [0.80, 2.31]	1.34 [0.84, 2.14]	1.40 [0.85, 2.31]
Binary FS status		1.79 [1.51, 2.12] ***	1.82 [1.50, 2.21] ***		
Linear FS status				1.12 [1.08, 1.16] ***	1.12 [1.07, 1.16] ***
FS*White (ref.)					
FS*Indigenous			0.99 [0.62, 1.59]		0.99 [0.91, 1.07]
FS*Asian			0.88 [0.53, 1.46]		1.06 [0.90, 1.24]
FS*Black			0.55 [0.19, 1.58]		0.87 [0.69, 1.09]
FS*Latinx			2.44 [0.89, 6.68] †		1.20 [0.91, 1.57]
FS*Arab			1.58 [0.50, 4.99]		1.24 [0.92, 1.68]
FS*'Other'			0.90 [0.33, 2.49]		0.94 [0.74, 1.20]

Note. Block 1 omitted; Block 2 is identical for both models; Results for smoking status, alcohol use, and illicit drug use were omitted due to space constraints; Interaction terms correspond to method of modelling FS status, so these terms change when method of modeling changes (when model 'resets' between Blocks 4 and 5); Ref. = reference category; Mar./Com. law = Married or common-law; Wid./Sep./Div. = widowed, separated, or divorced; FS = food security.

† $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Table 11

Racial/Ethnic Identity as a Moderator of the Association Between Food Security (FS) Status and Having to Wait a Week or More for Care for a Minor Health Problem via Hierarchical Logistic Regression, for the Binary and Linear Measures of FS.

N = 45,840	Odds Ratio [95% Confidence Intervals]				
		Binary Model		Linear Model	
	Block 2	Block 3	Block 4	Block 5	Block 6
Constant	1.76 [1.29, 2.40] ***	1.62 [1.18, 2.23] **	1.62 [1.18, 2.22] **	1.65 [1.20, 2.26] **	1.65 [1.20, 2.26] **
Age	0.99 [0.99, 1.00] ***	0.99 [0.99, 1.00] ***	0.99 [0.99, 1.00] ***	0.99 [0.99, 1.00] ***	0.99 [0.99, 1.00] ***
Sex	0.89 [0.84, 0.96] **	0.90 [0.84, 0.96] **	0.90 [0.84, 0.96] **	0.90 [0.84, 0.96] **	0.90 [0.84, 0.96] **
< high school (ref.)					
High school	0.94 [0.85, 1.05]	0.95 [0.85, 1.05]	0.95 [0.85, 1.05]	0.95 [0.85, 1.05]	0.95 [0.85, 1.05]
Post-secondary	0.94 [0.85, 1.03]	0.94 [0.85, 1.03]	0.94 [0.85, 1.03]	0.94 [0.85, 1.03]	0.94 [0.85, 1.03]
Mar./Com. law (ref.)					
Wid./Sep./Div.	0.93 [0.84, 1.03]	0.93 [0.83, 1.03]	0.93 [0.83, 1.03]	0.93 [0.84, 1.03]	0.93 [0.84, 1.03]
Single	0.91 [0.83, 1.00] †	0.91 [0.82, 1.00] †	0.91 [0.82, 1.00] *	0.91 [0.83, 1.00] †	0.91 [0.82, 1.00] †
Immigrant	0.91 [0.80, 1.04]	0.91 [0.80, 1.03]	0.91 [0.80, 1.04]	0.91 [0.80, 1.04]	0.91 [0.80, 1.04]
Homeowner	1.13 [1.03, 1.23] **	1.15 [1.05, 1.25] **	1.15 [1.05, 1.25] **	1.14 [1.05, 1.25] **	1.14 [1.05, 1.25] **
Physical health	0.93 [0.89, 0.97] ***	0.93 [0.90, 0.97] **	0.93 [0.90, 0.97] **	0.93 [0.90, 0.97] ***	0.93 [0.90, 0.97] ***
Mental health	0.90 [0.87, 0.94] ***	0.91 [0.87, 0.94] ***	0.91 [0.87, 0.94] ***	0.91 [0.87, 0.94] ***	0.91 [0.87, 0.94] ***
Normal weight (ref.)					
Underweight	1.11 [0.87, 1.41]	1.11 [0.87, 1.41]	1.10 [0.87, 1.41]	1.11 [0.87, 1.41]	1.11 [0.87, 1.41]
Overweight	1.01 [0.94, 1.09]	1.01 [0.94, 1.09]	1.01 [0.94, 1.09]	1.01 [0.94, 1.09]	1.01 [0.94, 1.09]
Obese	1.02 [0.94, 1.11]	1.02 [0.93, 1.11]	1.02 [0.93, 1.11]	1.02 [0.94, 1.11]	1.02 [0.94, 1.11]
Atlantic (ref.)					
Quebec	1.38 [1.26, 1.52] ***	1.39 [1.27, 1.52] ***	1.39 [1.27, 1.52] ***	1.39 [1.27, 1.52] ***	1.39 [1.27, 1.52] ***
Prairies	0.59 [0.54, 0.65] ***	0.59 [0.54, 0.65] ***	0.59 [0.54, 0.65] ***	0.59 [0.54, 0.65] ***	0.59 [0.54, 0.65] ***

N = 45,840	Odds Ratio [95% Confidence Intervals]				
		Binary Model		Linear Model	
	Block 2	Block 3	Block 4	Block 5	Block 6
British Columbia	0.47 [0.42, 0.53] ***	0.47 [0.42, 0.53] ***	0.47 [0.42, 0.53] ***	0.47 [0.42, 0.53] ***	0.47 [0.42, 0.53] ***
Territories	0.69 [0.52, 0.91] *	0.69 [0.51, 0.91] *	0.69 [0.51, 0.91] *	0.68 [0.51, 0.91] *	0.68 [0.51, 0.91] **
Children <18	0.98 [0.92, 1.04]	0.97 [0.91, 1.04]	0.97 [0.91, 1.04]	0.98 [0.91, 1.04]	0.98 [0.91, 1.04]
Household size	1.00 [0.94, 1.06]	1.00 [0.95, 1.06]	1.00 [0.95, 1.06]	1.00 [0.95, 1.06]	1.00 [0.95, 1.06]
Income	1.00 [0.99, 1.00]	1.00 [0.99, 1.00]	1.00 [0.99, 1.00]	1.00 [0.99, 1.00]	1.00 [0.99, 1.00]
White (ref.)					
Indigenous	0.96 [0.82, 1.13]	0.95 [0.81, 1.12]	0.95 [0.79, 1.15]	0.95 [0.81, 1.12]	0.94 [0.79, 1.12]
Asian	0.68 [0.57, 0.83] ***	0.68 [0.57, 0.83] ***	0.68 [0.56, 0.83] ***	0.69 [0.57, 0.83] ***	0.68 [0.56, 0.83] ***
Black	0.76 [0.56, 1.05] †	0.75 [0.55, 1.04] †	0.76 [0.53, 1.11]	0.76 [0.55, 1.04] †	0.79 [0.56, 1.12]
Latinx	1.21 [0.85, 1.74]	1.21 [0.84, 1.73]	1.26 [0.85, 1.88]	1.22 [0.85, 1.74]	1.27 [0.87, 1.86]
Arab	1.00 [0.63, 1.59]	1.00 [0.63, 1.59]	1.07 [0.63, 1.81]	1.00 [0.63, 1.59]	1.08 [0.65, 1.78]
‘Other’	0.74 [0.52, 1.04] †	0.74 [0.52, 1.04] †	0.80 [0.55, 1.16]	0.74 [0.53, 1.04] †	0.75 [0.52, 1.09]
Binary FS status		1.15 [1.03, 1.28] *	1.16 [1.03, 1.32] *		
Linear FS status				1.03 [1.00, 1.05] *	1.03 [1.00, 1.06] *
FS*White (ref.)					
FS*Indigenous			1.00 [0.71, 1.40]		1.01 [0.95, 1.08]
FS*Asian			1.07 [0.71, 1.63]		1.03 [0.90, 1.17]
FS*Black			0.94 [0.47, 1.86]		0.95 [0.82, 1.10]
FS*Latinx			0.77 [0.35, 1.71]		0.90 [0.70, 1.15]
FS*Arab			0.68 [0.26, 1.75]		0.87 [0.70, 1.10]
FS*‘Other’			0.59 [0.24, 1.42]		0.96 [0.76, 1.21]

Note. Block 1 omitted; Block 2 is identical for both models; Results for smoking status, alcohol use, and illicit drug use were omitted due to space constraints; Interaction terms correspond to method of modelling FS status, so these terms change when method of modeling changes (when model ‘resets’ between Blocks 4 and 5); Ref. = reference category; Mar./Com. law = Married or common-law; Wid./Sep./Div. = widowed, separated, or divorced; FS = food security.

† $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Table 12

Racial/Ethnic Identity as a Moderator of the Association Between Food Security (FS) Status and Having to Wait a Week or More for a Consultation via Hierarchical Logistic Regression, for the Binary and Linear Measures of FS.

N = 36,210	Odds Ratio [95% Confidence Intervals]				
		Binary Model		Linear Model	
	Block 2	Block 3	Block 4	Block 5	Block 6
Constant	1.21 [0.87, 1.68]	1.18 [0.85, 1.66]	1.18 [0.84, 1.65]	1.20 [0.86, 1.68]	1.21 [0.86, 1.69]
Age	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]
Sex	0.84 [0.79, 0.91] ***	0.85 [0.79, 0.91] ***	0.84 [0.79, 0.91] ***	0.84 [0.79, 0.91] ***	0.84 [0.79, 0.91] ***
< high school (ref.)					
High school	1.12 [1.00, 1.26] †	1.12 [1.00, 1.26] †	1.12 [1.00, 1.26] †	1.12 [1.00, 1.26] †	1.12 [1.00, 1.26] †
Post-secondary	1.20 [1.08, 1.33] **	1.20 [1.08, 1.34] **	1.20 [1.08, 1.34] **	1.20 [1.08, 1.33] **	1.20 [1.08, 1.33] **
Mar./Com. law (ref.)					
Wid./Sep./Div.	0.81 [0.73, 0.89] ***	0.80 [0.72, 0.89] ***	0.81 [0.72, 0.89] ***	0.81 [0.73, 0.89] ***	0.81 [0.73, 0.90] ***
Single	0.93 [0.83, 1.03]	0.93 [0.83, 1.03]	0.92 [0.83, 1.03]	0.93 [0.83, 1.03]	0.93 [0.83, 1.03]
Immigrant	0.85 [0.75, 0.97] *	0.85 [0.75, 0.97] *	0.85 [0.75, 0.97] *	0.85 [0.75, 0.97] *	0.85 [0.75, 0.97] *
Homeowner	1.14 [1.05, 1.24] **	1.15 [1.05, 1.25] **	1.14 [1.05, 1.25] **	1.14 [1.05, 1.25] **	1.14 [1.05, 1.24] **
Physical health	0.96 [0.92, 1.00] *	0.96 [0.92, 1.00] *	0.96 [0.92, 1.00] *	0.96 [0.92, 1.00] *	0.96 [0.92, 1.00] *
Mental health	1.00 [0.96, 1.05]	1.01 [0.96, 1.05]	1.00 [0.96, 1.05]	1.00 [0.96, 1.05]	1.00 [0.96, 1.05]
Normal weight (ref.)					
Underweight	1.02 [0.79, 1.32]	1.02 [0.79, 1.32]	1.02 [0.79, 1.32]	1.02 [0.79, 1.32]	1.02 [0.79, 1.32]
Overweight	0.97 [0.89, 1.05]	0.97 [0.89, 1.05]	0.97 [0.89, 1.05]	0.97 [0.89, 1.05]	0.97 [0.89, 1.05]
Obese	0.96 [0.88, 1.06]	0.96 [0.87, 1.06]	0.97 [0.88, 1.06]	0.96 [0.88, 1.06]	0.97 [0.88, 1.07]
Atlantic (ref.)					
Quebec	1.91 [1.72, 2.13] ***	1.91 [1.72, 2.13] ***	1.92 [1.73, 2.13] ***	1.91 [1.72, 2.13] ***	1.92 [1.73, 2.13] ***
Prairies	0.82 [0.74, 0.91] ***	0.82 [0.74, 0.91] ***	0.82 [0.75, 0.91] ***	0.82 [0.74, 0.91] ***	0.82 [0.75, 0.91] ***

N = 36,210	Odds Ratio [95% Confidence Intervals]				
		Binary Model		Linear Model	
	Block 2	Block 3	Block 4	Block 5	Block 6
British Columbia	0.63 [0.56, 0.70] ***	0.63 [0.56, 0.70] ***	0.63 [0.56, 0.70] ***	0.63 [0.56, 0.70] ***	0.63 [0.56, 0.70] ***
Territories	0.99 [0.79, 1.24]	0.99 [0.79, 1.23]	0.97 [0.77, 1.22]	0.99 [0.79, 1.24]	0.94 [0.75, 1.19]
Children <18	1.06 [0.99, 1.14] †	1.06 [0.99, 1.14] †	1.06 [0.99, 1.13] †	1.06 [0.99, 1.14] †	1.06 [0.99, 1.14] †
Household size	0.93 [0.88, 0.99] *	0.93 [0.88, 0.99] *	0.94 [0.89, 0.99] *	0.93 [0.88, 0.99] *	0.93 [0.88, 0.99] *
Income	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]
White (ref.)					
Indigenous	0.79 [0.67, 0.93] **	0.79 [0.67, 0.93] **	0.76 [0.63, 0.92] **	0.79 [0.67, 0.93] **	0.74 [0.61, 0.88] **
Asian	0.69 [0.58, 0.82] ***	0.69 [0.58, 0.82] ***	0.67 [0.56, 0.80] ***	0.69 [0.58, 0.82] ***	0.67 [0.56, 0.80] ***
Black	0.65 [0.47, 0.90] *	0.65 [0.47, 0.90] **	0.62 [0.43, 0.90] *	0.65 [0.47, 0.90] *	0.62 [0.43, 0.88] **
Latinx	1.25 [0.87, 1.80]	1.25 [0.87, 1.80]	1.49 [1.00, 2.24] †	1.25 [0.87, 1.80]	1.42 [0.96, 2.09] †
Arab	0.71 [0.46, 1.08]	0.71 [0.46, 1.08]	0.80 [0.50, 1.29]	0.71 [0.46, 1.08]	0.80 [0.51, 1.27]
‘Other’	0.77 [0.54, 1.09]	0.77 [0.54, 1.09]	0.83 [0.56, 1.22]	0.77 [0.54, 1.09]	0.80 [0.55, 1.16]
Binary FS status		1.03 [0.92, 1.16]	1.03 [0.90, 1.17]		
Linear FS status				1.00 [0.97, 1.03]	0.99 [0.96, 1.03]
FS*White (ref.)					
FS*Indigenous			1.15 [0.78, 1.69]		1.08 [0.99, 1.17] †
FS*Asian			1.29 [0.84, 1.99]		1.11 [0.97, 1.27]
FS*Black			1.17 [0.56, 2.44]		1.07 [0.89, 1.30]
FS*Latinx			0.40 [0.17, 0.92] *		0.76 [0.57, 1.00] *
FS*Arab			0.53 [0.20, 1.38]		0.79 [0.60, 1.04] †
FS*‘Other’			0.65 [0.28, 1.50]		0.94 [0.76, 1.16]

Note. Block 1 omitted; Block 2 is identical for both models; Results for smoking status, alcohol use, and illicit drug use were omitted due to space constraints; Interaction terms correspond to method of modelling FS status, so these terms change when method of modeling changes (when model ‘resets’ between Blocks 4 and 5); Ref. = reference category; Mar./Com. law = Married or common-law; Wid./Sep./Div. = widowed, separated, or divorced; FS = food security.

† p < .10, * p < .05, ** p < .01, *** p < .001

Table 13

Racial/Ethnic Identity as a Moderator of the Association Between Food Security (FS) Status and Skipping Prescription Refills or Doses Due to Cost via Hierarchical Logistic Regression, for the Binary and Linear Measures of FS.

N = 46,750	Odds Ratio [95% Confidence Intervals]				
		Binary Model		Linear Model	
	Block 2	Block 3	Block 4	Block 5	Block 6
Constant	1.49 [0.90, 2.48]	0.50 [0.29, 0.86] *	0.46 [0.27, 0.79] **	0.49 [0.29, 0.86] *	0.47 [0.27, 0.81] **
Age	0.98 [0.97, 0.98] ***	0.98 [0.98, 0.99] ***	0.98 [0.98, 0.99] ***	0.98 [0.98, 0.99] ***	0.98 [0.98, 0.99] ***
Sex	0.70 [0.61, 0.80] ***	0.71 [0.62, 0.82] ***	0.71 [0.62, 0.81] ***	0.70 [0.61, 0.80] ***	0.70 [0.61, 0.80] ***
< high school (ref.)					
High school	1.22 [1.00, 1.48] *	1.26 [1.03, 1.54] *	1.26 [1.03, 1.54] *	1.26 [1.02, 1.55] *	1.26 [1.02, 1.55] *
Post-secondary	1.13 [0.95, 1.36]	1.20 [1.00, 1.44] †	1.20 [1.00, 1.44] †	1.19 [0.98, 1.43] †	1.19 [0.98, 1.44] †
Mar./Com. law (ref.)					
Wid./Sep./Div.	1.18 [0.99, 1.40] †	1.10 [0.92, 1.31]	1.08 [0.91, 1.29]	1.09 [0.91, 1.31]	1.08 [0.90, 1.29]
Single	1.04 [0.87, 1.24]	1.02 [0.85, 1.23]	1.02 [0.84, 1.22]	1.02 [0.84, 1.23]	1.03 [0.85, 1.24]
Immigrant	1.02 [0.80, 1.29]	1.03 [0.81, 1.31]	1.04 [0.82, 1.32]	1.06 [0.83, 1.35]	1.06 [0.83, 1.36]
Homeowner	0.70 [0.60, 0.81] ***	0.82 [0.70, 0.96] *	0.82 [0.71, 0.96] *	0.84 [0.72, 0.98] *	0.85 [0.72, 0.99] *
Physical health	0.78 [0.72, 0.84] ***	0.81 [0.75, 0.88] ***	0.82 [0.76, 0.88] ***	0.82 [0.76, 0.88] ***	0.82 [0.76, 0.89] ***
Mental health	0.81 [0.75, 0.87] ***	0.86 [0.79, 0.93] ***	0.86 [0.79, 0.93] ***	0.87 [0.81, 0.94] ***	0.87 [0.81, 0.94] ***
Normal weight (ref.)					
Underweight	1.20 [0.81, 1.78]	1.23 [0.80, 1.88]	1.22 [0.80, 1.86]	1.27 [0.82, 1.97]	1.27 [0.82, 1.96]
Overweight	1.09 [0.94, 1.26]	1.08 [0.93, 1.25]	1.09 [0.94, 1.26]	1.09 [0.94, 1.27]	1.09 [0.94, 1.27]
Obese	1.11 [0.95, 1.29]	1.04 [0.89, 1.22]	1.03 [0.88, 1.21]	1.08 [0.92, 1.26]	1.07 [0.91, 1.25]
Atlantic (ref.)					
Quebec	0.80 [0.66, 0.97] *	0.85 [0.69, 1.03] †	0.85 [0.69, 1.03] †	0.84 [0.69, 1.03]	0.83 [0.68, 1.02] †
Prairies	1.18 [0.97, 1.43] †	1.21 [1.00, 1.48] †	1.22 [1.00, 1.48] *	1.19 [0.97, 1.45]	1.17 [0.96, 1.43]

N = 46,750	Odds Ratio [95% Confidence Intervals]				
		Binary Model		Linear Model	
	Block 2	Block 3	Block 4	Block 5	Block 6
British Columbia	1.31 [1.07, 1.59] **	1.39 [1.13, 1.70] **	1.38 [1.13, 1.69] **	1.33 [1.08, 1.65] **	1.33 [1.08, 1.63] **
Territories	0.35 [0.21, 0.61] ***	0.34 [0.19, 0.59] ***	0.38 [0.22, 0.65] ***	0.29 [0.16, 0.55] ***	0.37 [0.22, 0.64] ***
Children <18	1.01 [0.91, 1.12]	0.97 [0.87, 1.08]	0.97 [0.88, 1.08]	0.98 [0.88, 1.08]	0.97 [0.88, 1.08]
Household size	1.03 [0.95, 1.11]	1.02 [0.95, 1.11]	1.02 [0.94, 1.11]	1.03 [0.96, 1.12]	1.04 [0.96, 1.12]
Income	0.94 [0.92, 0.96] ***	0.96 [0.94, 0.98] ***	0.96 [0.94, 0.98] ***	0.96 [0.94, 0.98] ***	0.96 [0.94, 0.98] ***
White (ref.)					
Indigenous	1.27 [0.99, 1.63] †	1.16 [0.88, 1.53]	1.70 [1.19, 2.44] **	1.12 [0.83, 1.50]	1.65 [1.21, 2.24] **
Asian	0.97 [0.72, 1.31]	1.00 [0.73, 1.36]	1.08 [0.76, 1.53]	1.05 [0.77, 1.42]	0.98 [0.70, 1.37]
Black	1.33 [0.85, 2.08]	1.19 [0.75, 1.89]	1.61 [0.90, 2.90]	1.22 [0.77, 1.94]	1.28 [0.73, 2.25]
Latinx	1.11 [0.61, 2.02]	1.04 [0.56, 1.94]	1.38 [0.64, 2.96]	1.14 [0.62, 2.10]	1.23 [0.61, 2.47]
Arab	1.76 [0.84, 3.71]	1.81 [0.83, 3.92]	2.24 [0.87, 5.79] †	1.97 [0.94, 4.13] †	1.82 [0.73, 4.54]
‘Other’	1.32 [0.77, 2.25]	1.31 [0.76, 2.27]	1.25 [0.57, 2.72]	1.37 [0.81, 2.31]	1.01 [0.48, 2.16]
Binary FS status		3.34 [2.88, 3.87] ***	3.86 [3.29, 4.53] ***		
Linear FS status				1.29 [1.25, 1.33] ***	1.31 [1.27, 1.35] ***
FS*White (ref.)					
FS*Indigenous			0.46 [0.29, 0.72] **		0.85 [0.79, 0.91] ***
FS*Asian			0.78 [0.47, 1.29]		1.10 [0.97, 1.25]
FS*Black			0.49 [0.22, 1.08] †		0.97 [0.83, 1.13]
FS*Latinx			0.46 [0.15, 1.43]		0.94 [0.72, 1.22]
FS*Arab			0.53 [0.16, 1.75]		1.11 [0.84, 1.45]
FS*‘Other’			1.09 [0.36, 3.28]		1.22 [0.96, 1.55] †

Note. Block 1 omitted; Block 2 is identical for both models; Results for smoking status, alcohol use, and illicit drug use were omitted due to space constraints; Interaction terms correspond to method of modelling FS status, so these terms change when method of modeling changes (when model ‘resets’ between Blocks 4 and 5); Ref. = reference category; Mar./Com. law = Married or common-law; Wid./Sep./Div. = widowed, separated, or divorced; FS = food security.

† $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Table 14

Racial/Ethnic Identity as a Moderator of the Association Between Food Security (FS) Status and Visiting a Mental Health Professional in the Previous 12 Months via Hierarchical Logistic Regression, for the Binary and Linear Measures of FS.

N = 59,620	Odds Ratio [95% Confidence Intervals]				
		Binary Model		Linear Model	
	Block 2	Block 3	Block 4	Block 5	Block 6
Constant	38.0 [26.3, 54.9] ***	32.8 [22.5, 47.7] ***	31.9 [21.9, 46.6] ***	30.8 [21.1, 44.85] ***	30.4 [20.9, 44.40] ***
Age	0.97 [0.97, 0.98] ***	0.97 [0.97, 0.98] ***	0.97 [0.97, 0.98] ***	0.97 [0.97, 0.98] ***	0.97 [0.97, 0.98] ***
Sex	0.44 [0.40, 0.48] ***	0.44 [0.40, 0.48] ***	0.44 [0.40, 0.48] ***	0.44 [0.40, 0.48] ***	0.44 [0.40, 0.48] ***
< high school (ref.)					
High school	1.50 [1.29, 1.73] ***	1.51 [1.30, 1.75] ***	1.51 [1.30, 1.75] ***	1.51 [1.31, 1.76] ***	1.52 [1.31, 1.76] ***
Post-secondary	1.89 [1.65, 2.16] ***	1.92 [1.68, 2.19] ***	1.93 [1.68, 2.20] ***	1.93 [1.69, 2.21] ***	1.93 [1.69, 2.21] ***
Mar./Com. law (ref.)					
Wid./Sep./Div.	1.37 [1.21, 1.55] ***	1.35 [1.20, 1.53] ***	1.35 [1.19, 1.52] ***	1.35 [1.19, 1.52] ***	1.34 [1.19, 1.52] ***
Single	0.92 [0.82, 1.02]	0.91 [0.82, 1.02] †	0.91 [0.81, 1.01] †	0.91 [0.82, 1.02] †	0.91 [0.82, 1.02] †
Immigrant	0.72 [0.61, 0.85] ***	0.72 [0.61, 0.85] ***	0.72 [0.61, 0.85] ***	0.72 [0.61, 0.85] ***	0.72 [0.61, 0.85] ***
Homeowner	1.02 [0.92, 1.12]	1.05 [0.95, 1.16]	1.05 [0.96, 1.16]	1.07 [0.97, 1.18]	1.07 [0.97, 1.18]
Physical health	0.87 [0.83, 0.91] ***	0.88 [0.84, 0.92] ***	0.88 [0.84, 0.92] ***	0.88 [0.84, 0.93] ***	0.88 [0.84, 0.93] ***
Mental health	0.39 [0.37, 0.41] ***	0.39 [0.37, 0.41] ***	0.39 [0.37, 0.41] ***	0.39 [0.38, 0.41] ***	0.39 [0.38, 0.41] ***
Normal weight (ref.)					
Underweight	0.83 [0.62, 1.10]	0.83 [0.62, 1.10]	0.82 [0.62, 1.09]	0.83 [0.63, 1.10]	0.83 [0.62, 1.10]
Overweight	1.04 [0.95, 1.15]	1.04 [0.95, 1.15]	1.04 [0.95, 1.15]	1.04 [0.95, 1.15]	1.04 [0.95, 1.15]
Obese	1.11 [1.00, 1.23] *	1.10 [0.99, 1.22] †	1.10 [0.99, 1.22] †	1.10 [0.99, 1.23] †	1.10 [0.99, 1.22] †
Atlantic (ref.)					
Quebec	0.97 [0.86, 1.10]	0.98 [0.87, 1.11]	0.98 [0.87, 1.11]	0.99 [0.87, 1.12]	0.99 [0.87, 1.12]
Prairies	1.10 [0.98, 1.24]	1.11 [0.98, 1.25] †	1.11 [0.99, 1.26] †	1.11 [0.98, 1.25] †	1.11 [0.98, 1.26] †

N = 59,620	Odds Ratio [95% Confidence Intervals]				
		Binary Model		Linear Model	
	Block 2	Block 3	Block 4	Block 5	Block 6
British Columbia	1.21 [1.06, 1.38] **	1.22 [1.07, 1.39] **	1.22 [1.07, 1.39] **	1.21 [1.06, 1.38] **	1.21 [1.06, 1.38] **
Territories	0.86 [0.66, 1.12]	0.85 [0.65, 1.12]	0.87 [0.67, 1.14]	0.85 [0.65, 1.11]	0.87 [0.66, 1.14]
Children <18	1.20 [1.12, 1.30] ***	1.20 [1.11, 1.29] ***	1.20 [1.11, 1.29] ***	1.19 [1.11, 1.28] ***	1.19 [1.11, 1.28] ***
Household size	0.85 [0.80, 0.90] ***	0.85 [0.80, 0.90] ***	0.85 [0.80, 0.90] ***	0.85 [0.80, 0.91] ***	0.85 [0.80, 0.91] ***
Income	1.00 [1.00, 1.00]	1.00 [1.00, 1.00] †	1.00 [1.00, 1.00] †	1.00 [1.00, 1.00] †	1.00 [1.00, 1.00] †
White (ref.)					
Indigenous	0.93 [0.79, 1.09]	0.91 [0.77, 1.07]	0.95 [0.78, 1.17]	0.89 [0.75, 1.05]	0.93 [0.77, 1.13]
Asian	0.50 [0.39, 0.63] ***	0.50 [0.39, 0.63] ***	0.50 [0.39, 0.66] ***	0.50 [0.39, 0.64] ***	0.50 [0.38, 0.64] ***
Black	0.51 [0.31, 0.82] **	0.49 [0.30, 0.80] **	0.59 [0.32, 1.10] †	0.49 [0.30, 0.80] **	0.55 [0.31, 0.98] *
Latinx	0.52 [0.33, 0.81] **	0.51 [0.33, 0.80] **	0.60 [0.37, 0.99] *	0.52 [0.33, 0.81] **	0.59 [0.36, 0.94] *
Arab	0.86 [0.46, 1.62]	0.87 [0.46, 1.63]	1.11 [0.57, 2.15]	0.88 [0.47, 1.65]	1.00 [0.51, 1.96]
‘Other’	0.70 [0.46, 1.09]	0.70 [0.45, 1.09]	0.77 [0.48, 1.23]	0.71 [0.46, 1.09]	0.68 [0.42, 1.09]
Binary FS status		1.24 [1.11, 1.39] ***	1.34 [1.18, 1.51] ***		
Linear FS status				1.07 [1.05, 1.10] ***	1.08 [1.06, 1.11] ***
FS*White (ref.)					
FS*Indigenous			0.84 [0.61, 1.16]		0.97 [0.91, 1.03]
FS*Asian			0.89 [0.57, 1.40]		1.02 [0.91, 1.14]
FS*Black			0.55 [0.23, 1.32]		0.90 [0.74, 1.10]
FS*Latinx			0.47 [0.20, 1.10] †		0.82 [0.66, 1.02] †
FS*Arab			0.20 [0.07, 0.55] **		0.76 [0.54, 1.06]
FS*‘Other’			0.64 [0.21, 2.02]		1.04 [0.74, 1.47]

Note. Block 1 omitted; Block 2 is identical for both models; Results for smoking status, alcohol use, and illicit drug use were omitted due to space constraints; Interaction terms correspond to method of modelling FS status, so these terms change when method of modeling changes (when model ‘resets’ between Blocks 4 and 5); Ref. = reference category; Mar./Com. law = Married or common-law; Wid./Sep./Div. = widowed, separated, or divorced; FS = food security.

† $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Table 15

Racial/Ethnic Identity as a Moderator of the Association Between Food Security (FS) Status and Visiting a General Practitioner About Mental Health via Hierarchical Logistic Regression, for the Binary and Linear Measures of FS.

N = 8,680	Odds Ratio [95% Confidence Intervals]				
		Binary Model		Linear Model	
	Block 2	Block 3	Block 4	Block 5	Block 6
Constant	3.61 [1.93, 6.75] ***	3.61 [1.90, 6.87] ***	3.59 [1.89, 6.84] ***	3.83 [2.02, 7.28] ***	3.77 [1.98, 7.18] ***
Age	1.01 [1.01, 1.02] ***	1.01 [1.01, 1.02] ***	1.01 [1.01, 1.02] ***	1.01 [1.01, 1.02] ***	1.01 [1.01, 1.02] ***
Sex	0.67 [0.58, 0.78] ***	0.67 [0.58, 0.78] ***	0.67 [0.57, 0.78] ***	0.67 [0.57, 0.78] ***	0.67 [0.57, 0.78] ***
< high school (ref.)					
High school	0.87 [0.66, 1.16]	0.87 [0.66, 1.16]	0.87 [0.66, 1.15]	0.87 [0.66, 1.15]	0.87 [0.66, 1.15]
Post-secondary	0.67 [0.52, 0.87] **	0.67 [0.52, 0.87] **	0.67 [0.52, 0.87] **	0.67 [0.52, 0.87] **	0.67 [0.52, 0.87] **
Mar./Com. law (ref.)					
Wid./Sep./Div.	0.67 [0.54, 0.83] ***	0.67 [0.54, 0.84] ***	0.67 [0.54, 0.84] ***	0.68 [0.55, 0.84] ***	0.68 [0.55, 0.85] **
Single	0.76 [0.63, 0.92] **	0.76 [0.63, 0.92] **	0.77 [0.63, 0.93] **	0.76 [0.63, 0.93] **	0.77 [0.63, 0.93] **
Immigrant	0.87 [0.68, 1.12]	0.87 [0.68, 1.12]	0.87 [0.68, 1.12]	0.87 [0.68, 1.12]	0.87 [0.68, 1.12]
Homeowner	1.29 [1.09, 1.53] **	1.29 [1.08, 1.54] **	1.29 [1.08, 1.54] **	1.27 [1.06, 1.51] **	1.26 [1.06, 1.50] *
Physical health	0.89 [0.82, 0.97] **	0.89 [0.82, 0.97] **	0.89 [0.82, 0.97] **	0.89 [0.82, 0.97] **	0.89 [0.82, 0.97] **
Mental health	0.79 [0.72, 0.85] ***	0.79 [0.72, 0.85] ***	0.78 [0.72, 0.85] ***	0.78 [0.72, 0.85] ***	0.78 [0.72, 0.85] ***
Normal weight (ref.)					
Underweight	0.79 [0.49, 1.27]	0.79 [0.49, 1.27]	0.79 [0.49, 1.27]	0.79 [0.49, 1.28]	0.79 [0.49, 1.28]
Overweight	1.18 [1.01, 1.40] *	1.18 [1.01, 1.40] *	1.19 [1.01, 1.40] *	1.19 [1.01, 1.40] *	1.19 [1.01, 1.40] *
Obese	1.13 [0.94, 1.36]	1.13 [0.94, 1.36]	1.14 [0.94, 1.37]	1.13 [0.94, 1.36]	1.14 [0.95, 1.37]
Atlantic (ref.)					
Quebec	0.52 [0.41, 0.65] ***	0.52 [0.41, 0.65] ***	0.52 [0.42, 0.65] ***	0.52 [0.41, 0.64] ***	0.52 [0.42, 0.65] ***
Prairies	0.89 [0.71, 1.10]	0.89 [0.71, 1.10]	0.89 [0.71, 1.10]	0.89 [0.71, 1.10]	0.89 [0.71, 1.10]

N = 8,680	Odds Ratio [95% Confidence Intervals]				
		Binary Model		Linear Model	
	Block 2	Block 3	Block 4	Block 5	Block 6
British Columbia	0.91 [0.72, 1.16]	0.91 [0.72, 1.16]	0.91 [0.72, 1.16]	0.91 [0.72, 1.16]	0.91 [0.72, 1.16]
Territories	0.31 [0.19, 0.51] ***	0.31 [0.19, 0.51] ***	0.32 [0.20, 0.51] ***	0.31 [0.19, 0.51] ***	0.31 [0.19, 0.51] ***
Children <18	1.13 [0.99, 1.29] †	1.13 [0.99, 1.29] †	1.13 [0.99, 1.29] †	1.13 [0.99, 1.29] †	1.13 [0.99, 1.29] †
Household size	0.99 [0.88, 1.11]	0.99 [0.88, 1.11]	0.99 [0.88, 1.11]	0.99 [0.88, 1.11]	0.99 [0.88, 1.11]
Income	1.00 [0.99, 1.00]	1.00 [0.99, 1.00]	1.00 [0.99, 1.00]	1.00 [0.99, 1.00]	1.00 [0.99, 1.00]
White (ref.)					
Indigenous	0.92 [0.69, 1.22]	0.92 [0.69, 1.23]	1.00 [0.69, 1.44]	0.93 [0.70, 1.24]	0.94 [0.67, 1.32]
Asian	1.00 [0.68, 1.47]	1.00 [0.68, 1.47]	1.13 [0.73, 1.73]	0.99 [0.67, 1.46]	1.00 [0.66, 1.50]
Black	1.95 [0.94, 4.04] †	1.95 [0.94, 4.04] †	1.71 [0.67, 4.33]	1.96 [0.95, 4.05] †	1.69 [0.72, 3.95]
Latinx	0.76 [0.39, 1.50]	0.76 [0.39, 1.50]	0.82 [0.37, 1.82]	0.76 [0.38, 1.50]	0.76 [0.36, 1.62]
Arab	0.95 [0.35, 2.53]	0.94 [0.35, 2.52]	0.85 [0.28, 2.59]	0.93 [0.35, 2.48]	0.86 [0.30, 2.48]
‘Other’	0.92 [0.45, 1.86]	0.92 [0.45, 1.86]	1.41 [0.61, 3.25]	0.92 [0.45, 1.85]	1.30 [0.58, 2.92]
Binary FS status		1.00 [0.83, 1.21]	1.06 [0.86, 1.31]		
Linear FS status				0.98 [0.95, 1.02]	0.98 [0.94, 1.03]
FS*White (ref.)					
FS*Indigenous			0.80 [0.46, 1.40]		0.99 [0.90, 1.10]
FS*Asian			0.53 [0.22, 1.27]		0.99 [0.80, 1.24]
FS*Black			1.56 [0.38, 6.37]		1.14 [0.87, 1.50]
FS*Latinx			0.72 [0.18, 2.86]		1.00 [0.71, 1.41]
FS*Arab			3.04 [0.46, 20.0]		1.22 [0.84, 1.77]
FS*‘Other’			0.13 [0.03, 0.54] **		0.69 [0.50, 0.94] *

Note. Block 1 omitted; Block 2 is identical for both models; Results for smoking status, alcohol use, and illicit drug use were omitted due to space constraints; Interaction terms correspond to method of modelling FS status, so these terms change when method of modeling changes (when model ‘resets’ between Blocks 4 and 5); Ref. = reference category; Mar./Com. law = Married or common-law; Wid./Sep./Div. = widowed, separated, or divorced; FS = food security.

† $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Table 16

Racial/Ethnic Identity as a Moderator of the Association Between Food Security (FS) Status and Visiting a Psychiatrist via Hierarchical Logistic Regression, for the Binary and Linear Measures of FS.

N = 8,690	Odds Ratio [95% Confidence Intervals]				
		Binary Model		Linear Model	
	Block 2	Block 3	Block 4	Block 5	Block 6
Constant	0.68 [0.30, 1.58]	0.54 [0.23, 1.29]	0.51 [0.21, 1.22]	0.52 [0.22, 1.24]	0.50 [0.21, 1.20]
Age	1.00 [0.99, 1.01]	1.00 [0.99, 1.01]	1.00 [0.99, 1.01]	1.00 [0.99, 1.01]	1.00 [0.99, 1.01]
Sex	1.36 [1.09, 1.69] **	1.37 [1.10, 1.70] **	1.36 [1.10, 1.69] **	1.38 [1.11, 1.71] **	1.37 [1.11, 1.70] **
< high school (ref.)					
High school	1.44 [1.02, 2.02] *	1.45 [1.03, 2.04] *	1.45 [1.03, 2.05] *	1.47 [1.04, 2.07] *	1.47 [1.04, 2.07] *
Post-secondary	1.75 [1.26, 2.43] **	1.78 [1.28, 2.48] **	1.77 [1.27, 2.47] **	1.79 [1.29, 2.50] **	1.79 [1.28, 2.50] **
Mar./Com. law (ref.)					
Wid./Sep./Div.	1.27 [0.97, 1.68] †	1.24 [0.94, 1.64]	1.23 [0.93, 1.63]	1.24 [0.93, 1.64]	1.24 [0.93, 1.64]
Single	1.28 [0.98, 1.66] †	1.26 [0.97, 1.64] †	1.28 [0.99, 1.66] †	1.27 [0.98, 1.65] †	1.28 [0.98, 1.66] †
Immigrant	1.17 [0.86, 1.58]	1.17 [0.87, 1.58]	1.17 [0.87, 1.59]	1.18 [0.88, 1.60]	1.19 [0.88, 1.60]
Homeowner	0.69 [0.56, 0.87] **	0.73 [0.58, 0.92] **	0.72 [0.58, 0.91] **	0.75 [0.60, 0.95] *	0.76 [0.06, 0.95] *
Physical health	0.86 [0.76, 0.96] **	0.87 [0.77, 0.97] *	0.87 [0.78, 0.97] *	0.87 [0.77, 0.97] *	0.87 [0.78, 0.97] *
Mental health	0.70 [0.63, 0.79] ***	0.71 [0.63, 0.80] ***	0.71 [0.63, 0.80] ***	0.72 [0.64, 0.80] ***	0.72 [0.64, 0.80] ***
Normal weight (ref.)					
Underweight	0.52 [0.27, 1.01] †	0.51 [0.26, 1.01] †	0.50 [0.25, 1.01] †	0.53 [0.27, 1.03] †	0.53 [0.27, 1.02] †
Overweight	1.02 [0.80, 1.30]	1.02 [0.80, 1.30]	1.02 [0.81, 1.30]	1.02 [0.80, 1.30]	1.03 [0.81, 1.31]
Obese	1.16 [0.92, 1.46]	1.14 [0.91, 1.44]	1.14 [0.91, 1.43]	1.15 [0.91, 1.44]	1.15 [0.91, 1.44]
Atlantic (ref.)					
Quebec	0.96 [0.71, 1.29]	0.97 [0.72, 1.31]	0.96 [0.71, 1.30]	0.97 [0.71, 1.30]	0.96 [0.71, 1.29]
Prairies	1.02 [0.77, 1.36]	1.03 [0.77, 1.37]	1.02 [0.76, 1.36]	1.02 [0.77, 1.36]	1.01 [0.76, 1.35]

N = 8,690	Odds Ratio [95% Confidence Intervals]				
		Binary Model		Linear Model	
	Block 2	Block 3	Block 4	Block 5	Block 6
British Columbia	0.72 [0.53, 0.99] *	0.73 [0.53, 0.99] *	0.71 [0.52, 0.98] *	0.72 [0.53, 0.99] *	0.72 [0.52, 0.99] *
Territories	0.30 [0.16, 0.59] ***	0.31 [0.16, 0.59] ***	0.32 [0.16, 0.62] **	0.31 [0.16, 0.59] ***	0.32 [0.16, 0.61] **
Children <18	0.79 [0.65, 0.96] *	0.78 [0.64, 0.95] *	0.77 [0.63, 0.94] **	0.78 [0.64, 0.94] *	0.78 [0.64, 0.94] *
Household size	1.11 [0.96, 1.28]	1.11 [0.96, 1.28]	1.13 [0.97, 1.30]	1.11 [0.96, 1.28]	1.11 [0.96, 1.28]
Income	1.00 [0.99, 1.01]	1.00 [0.99, 1.01]	1.00 [0.99, 1.01]	1.00 [0.99, 1.01]	1.00 [0.99, 1.01]
White (ref.)					
Indigenous	1.11 [0.77, 1.62]	1.09 [0.75, 1.60]	1.50 [0.92, 2.45]	1.07 [0.73, 1.57]	1.31 [0.82, 2.09]
Asian	0.74 [0.45, 1.20]	0.74 [0.46, 1.21]	0.65 [0.37, 1.13]	0.74 [0.45, 1.21]	0.73 [0.44, 1.23]
Black	1.34 [0.54, 3.31]	1.35 [0.54, 3.37]	1.62 [0.51, 5.12]	1.35 [0.54, 3.37]	1.52 [0.53, 4.35]
Latinx	1.05 [0.31, 3.54]	1.05 [0.31, 3.54]	1.28 [0.31, 5.39]	1.06 [0.31, 3.57]	1.16 [0.28, 4.76]
Arab	0.25 [0.08, 0.82] *	0.27 [0.08, 0.84] *	0.12 [0.03, 0.58] **	0.27 [0.08, 0.85] *	0.25 [0.07, 0.86] *
‘Other’	0.54 [0.23, 1.29]	0.55 [0.23, 1.32]	0.55 [0.20, 1.54]	0.55 [0.23, 1.31]	0.55 [0.20, 1.46]
Binary FS status		1.33 [1.05, 1.68] *	1.38 [1.08, 1.78] *		
Linear FS status				1.07 [1.02, 1.12] **	1.08 [1.03, 1.14] **
FS*White (ref.)					
FS*Indigenous			0.48 [0.24, 0.94] *		0.92 [0.82, 1.02]
FS*Asian			1.58 [0.56, 4.45]		1.01 [0.79, 1.29]
FS*Black			0.53 [0.11, 2.58]		0.90 [0.66, 1.21]
FS*Latinx			0.39 [0.06, 2.73]		0.90 [0.58, 1.39]
FS*Arab			14.9 [2.0, 110.2] **		1.11 [0.83, 1.48]
FS*‘Other’			1.00 [0.15, 6.55]		1.01 [0.73, 1.39]

Note. Block 1 omitted; Block 2 is identical for both models; Results for smoking status, alcohol use, and illicit drug use were omitted due to space constraints; Interaction terms correspond to method of modelling FS status, so these terms change when method of modeling changes (when model ‘resets’ between Blocks 4 and 5); Ref. = reference category; Mar./Com. law = Married or common-law; Wid./Sep./Div. = widowed, separated, or divorced; FS = food security.

† $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Table 17

Racial/Ethnic Identity as a Moderator of the Association Between Food Security (FS) Status and Visiting a Psychologist via Hierarchical Logistic Regression, for the Binary and Linear Measures of FS.

N = 8,680	Odds Ratio [95% Confidence Intervals]				
		Binary Model		Linear Model	
	Block 2	Block 3	Block 4	Block 5	Block 6
Constant	0.28 [0.13, 0.59] **	0.29 [0.13, 0.64] **	0.30 [0.14, 0.65] **	0.29 [0.13, 0.64] **	0.30 [0.13, 0.66] **
Age	0.98 [0.98, 0.99] ***	0.98 [0.98, 0.99] ***	0.98 [0.98, 0.99] ***	0.98 [0.98, 0.99] ***	0.98 [0.98, 0.99] ***
Sex	1.15 [0.97, 1.37]	1.15 [0.96, 1.37]	1.15 [0.97, 1.37]	1.15 [0.96, 1.36]	1.15 [0.97, 1.37]
< high school (ref.)					
High school	1.39 [0.99, 1.96] †	1.39 [0.98, 1.96] †	1.38 [0.98, 1.95] †	1.39 [0.98, 1.96] †	1.38 [0.98, 1.94] †
Post-secondary	1.77 [1.29, 2.42] ***	1.76 [1.28, 2.41] ***	1.76 [1.29, 2.40] ***	1.76 [1.29, 2.41] ***	1.76 [1.28, 2.40] ***
Mar./Com. law (ref.)					
Wid./Sep./Div.	1.71 [1.34, 2.19] ***	1.73 [1.35, 2.21] ***	1.73 [1.36, 2.22] ***	1.72 [1.35, 2.20] ***	1.74 [1.36, 2.22] ***
Single	1.16 [0.93, 1.45]	1.17 [0.94, 1.46]	1.17 [0.94, 1.47]	1.17 [0.93, 1.46]	1.17 [0.93, 1.46]
Immigrant	1.04 [0.75, 1.44]	1.04 [0.75, 1.44]	1.04 [0.75, 1.45]	1.04 [0.75, 1.44]	1.04 [0.75, 1.44]
Homeowner	1.31 [1.06, 1.61] *	1.29 [1.05, 1.59] *	1.28 [1.04, 1.57] *	1.29 [1.05, 1.58] *	1.28 [1.04, 1.57] *
Physical health	1.01 [0.91, 1.11]	1.00 [0.91, 1.11]	1.00 [0.91, 1.11]	1.00 [0.91, 1.11]	1.00 [0.91, 1.11]
Mental health	0.95 [0.86, 1.05]	0.95 [0.86, 1.05]	0.95 [0.86, 1.05]	0.95 [0.86, 1.05]	0.95 [0.86, 1.05]
Normal weight (ref.)					
Underweight	1.44 [0.87, 2.39]	1.45 [0.87, 2.41]	1.45 [0.87, 2.42]	1.44 [0.87, 2.40]	1.45 [0.87, 2.41]
Overweight	0.81 [0.67, 0.98] *	0.81 [0.67, 0.98] *	0.81 [0.67, 0.98] *	0.81 [0.67, 0.98] *	0.81 [0.67, 0.98] *
Obese	0.89 [0.72, 1.11]	0.89 [0.72, 1.11]	0.90 [0.73, 1.12]	0.89 [0.72, 1.11]	0.90 [0.73, 1.12]
Atlantic (ref.)					
Quebec	3.47 [2.70, 4.47] ***	3.46 [2.69, 4.46] ***	3.48 [2.70, 4.49] ***	3.47 [2.69, 4.47] ***	3.51 [2.72, 4.52] ***
Prairies	1.07 [0.82, 1.38]	1.06 [0.82, 1.38]	1.06 [0.82, 1.38]	1.07 [0.82, 1.39]	1.07 [0.83, 1.39]

N = 8,680	Odds Ratio [95% Confidence Intervals]				
		Binary Model		Linear Model	
	Block 2	Block 3	Block 4	Block 5	Block 6
British Columbia	0.65 [0.48, 0.87] **	0.65 [0.48, 0.87] **	0.64 [0.48, 0.87] **	0.65 [0.48, 0.87] **	0.65 [0.48, 0.87] **
Territories	0.90 [0.52, 1.55]	0.90 [0.52, 1.54]	0.86 [0.50, 1.49]	0.90 [0.52, 1.55]	0.86 [0.50, 1.49]
Children <18	0.94 [0.82, 1.09]	0.95 [0.82, 1.09]	0.95 [0.82, 1.10]	0.95 [0.82, 1.09]	0.95 [0.82, 1.09]
Household size	0.96 [0.85, 1.09]	0.96 [0.85, 1.09]	0.96 [0.85, 1.09]	0.96 [0.85, 1.09]	0.97 [0.85, 1.09]
Income	1.01 [1.00, 1.01] †	1.01 [1.00, 1.01] †	1.01 [1.00, 1.01] †	1.01 [1.00, 1.01] †	1.01 [1.00, 1.01] †
White (ref.)					
Indigenous	0.61 [0.42, 0.88] **	0.61 [0.43, 0.88] **	0.54 [0.34, 0.86] **	0.61 [0.43, 0.89] **	0.50 [0.33, 0.77] **
Asian	1.29 [0.78, 2.12]	1.28 [0.78, 2.12]	1.21 [0.69, 2.12]	1.29 [0.78, 2.12]	1.29 [0.76, 2.18]
Black	0.76 [0.28, 2.05]	0.76 [0.28, 2.07]	0.55 [0.14, 2.23]	0.76 [0.28, 2.06]	0.67 [0.21, 2.18]
Latinx	1.70 [0.84, 3.44]	1.70 [0.85, 3.44]	1.81 [0.81, 4.07]	1.70 [0.84, 3.43]	1.56 [0.70, 3.46]
Arab	1.27 [0.53, 3.06]	1.25 [0.52, 3.03]	1.22 [0.46, 3.23]	1.26 [0.52, 3.03]	1.18 [0.46, 3.04]
‘Other’	0.88 [0.39, 1.96]	0.87 [0.39, 1.94]	1.30 [0.57, 2.95]	0.88 [0.40, 1.94]	1.28 [0.57, 2.89]
Binary FS status		0.92 [0.74, 1.15]	0.89 [0.70, 1.14]		
Linear FS status				0.98 [0.93, 1.04]	0.97 [0.92, 1.04]
FS*White (ref.)					
FS*Indigenous			1.44 [0.71, 2.93]		1.11 [0.99, 1.25] †
FS*Asian			1.38 [0.51, 3.71]		0.99 [0.77, 1.26]
FS*Black			2.80 [0.52, 15.1]		1.12 [0.82, 1.53]
FS*Latinx			0.74 [0.19, 2.91]		1.13 [0.81, 1.58]
FS*Arab			1.11 [0.24, 5.19]		1.12 [0.86, 1.46]
FS*‘Other’			0.06 [0.01, 0.41] **		0.52 [0.31, 0.87] *

Note. Block 1 omitted; Block 2 is identical for both models; Results for smoking status, alcohol use, and illicit drug use were omitted due to space constraints; Interaction terms correspond to method of modelling FS status, so these terms change when method of modeling changes (when model ‘resets’ between Blocks 4 and 5); Ref. = reference category; Mar./Com. law = Married or common-law; Wid./Sep./Div. = widowed, separated, or divorced; FS = food security.

† p < .10, * p < .05, ** p < .01, *** p < .001

Table 18

Racial/Ethnic Identity as a Moderator of the Association Between Food Security (FS) Status and Visiting a Social Worker or Counsellor via Hierarchical Logistic Regression, for the Binary and Linear Measures of FS.

N = 8,680	Odds Ratio [95% Confidence Intervals]				
		Binary Model		Linear Model	
	Block 2	Block 3	Block 4	Block 5	Block 6
Constant	1.92 [0.91, 4.05] †	1.66 [0.75, 3.65]	1.67 [0.76, 3.67]	1.73 [0.79, 3.78]	1.71 [0.79, 3.71]
Age	0.98 [0.97, 0.98] ***	0.98 [0.97, 0.98] ***	0.98 [0.97, 0.98] ***	0.98 [0.97, 0.98] ***	0.98 [0.97, 0.98] ***
Sex	0.93 [0.78, 1.12]	0.94 [0.78, 1.12]	0.95 [0.79, 1.13]	0.94 [0.78, 1.12]	0.95 [0.79, 1.13]
< high school (ref.)					
High school	0.91 [0.67, 1.25]	0.92 [0.67, 1.26]	0.93 [0.68, 1.27]	0.92 [0.67, 1.27]	0.93 [0.68, 1.27]
Post-secondary	1.02 [0.76, 1.36]	1.03 [0.77, 1.38]	1.05 [0.79, 1.39]	1.03 [0.77, 1.38]	1.05 [0.79, 1.40]
Mar./Com. law (ref.)					
Wid./Sep./Div.	1.06 [0.84, 1.33]	1.04 [0.83, 1.31]	1.03 [0.82, 1.29]	1.05 [0.83, 1.31]	1.03 [0.82, 1.29]
Single	0.86 [0.69, 1.09]	0.86 [0.68, 1.08]	0.86 [0.68, 1.08]	0.86 [0.69, 1.08]	0.87 [0.69, 1.09]
Immigrant	0.99 [0.73, 1.33]	0.99 [0.73, 1.32]	0.97 [0.72, 1.30]	0.99 [0.74, 1.33]	0.97 [0.72, 1.31]
Homeowner	1.00 [0.83, 1.22]	1.03 [0.85, 1.25]	1.04 [0.85, 1.26]	1.03 [0.85, 1.25]	1.04 [0.85, 1.26]
Physical health	0.92 [0.82, 1.03]	0.92 [0.82, 1.04]	0.92 [0.82, 1.03]	0.92 [0.82, 1.04]	0.92 [0.82, 1.03]
Mental health	0.95 [0.86, 1.04]	0.95 [0.87, 1.05]	0.95 [0.86, 1.04]	0.95 [0.87, 1.05]	0.95 [0.86, 1.04]
Normal weight (ref.)					
Underweight	0.90 [0.54, 1.50]	0.88 [0.53, 1.47]	0.89 [0.54, 1.48]	0.89 [0.53, 1.49]	0.89 [0.53, 1.50]
Overweight	1.03 [0.84, 1.27]	1.03 [0.84, 1.27]	1.02 [0.83, 1.26]	1.03 [0.84, 1.27]	1.02 [0.83, 1.26]
Obese	0.87 [0.70, 1.08]	0.86 [0.69, 1.07]	0.85 [0.68, 1.05]	0.86 [0.70, 1.07]	0.85 [0.69, 1.06]
Atlantic (ref.)					
Quebec	0.67 [0.49, 0.90] **	0.67 [0.49, 0.91] *	0.67 [0.49, 0.91] *	0.67 [0.49, 0.91] *	0.66 [0.49, 0.89] **
Prairies	1.17 [0.88, 1.54]	1.17 [0.89, 1.55]	1.18 [0.89, 1.56]	1.17 [0.88, 1.55]	1.17 [0.88, 1.55]

N = 8,680	Odds Ratio [95% Confidence Intervals]				
		Binary Model		Linear Model	
	Block 2	Block 3	Block 4	Block 5	Block 6
British Columbia	1.68 [1.26, 2.24] ***	1.69 [1.27, 2.26] ***	1.70 [1.27, 2.27] ***	1.68 [1.26, 2.25] ***	1.68 [1.26, 2.24] ***
Territories	2.40 [1.46, 3.94] **	2.42 [1.47, 3.98] **	2.42 [1.47, 3.99] **	2.41 [1.46, 3.97] **	2.44 [1.49, 4.02] ***
Children <18	1.18 [1.02, 1.37] *	1.17 [1.01, 1.36] *	1.17 [1.01, 1.35] *	1.17 [1.01, 1.36] *	1.17 [1.01, 1.35] *
Household size	0.83 [0.74, 0.94] **	0.83 [0.74, 0.94] **	0.83 [0.74, 0.94] **	0.83 [0.74, 0.94] **	0.83 [0.74, 0.94] **
Income	0.99 [0.97, 1.00] *	0.99 [0.98, 1.00] †	0.99 [0.97, 1.00] †	0.99 [0.97, 1.00] †	0.99 [0.97, 1.00] *
White (ref.)					
Indigenous	1.28 [0.93, 1.75]	1.26 [0.92, 1.73]	1.17 [0.75, 1.84]	1.26 [0.91, 1.73]	1.29 [0.87, 1.91]
Asian	1.05 [0.66, 1.69]	1.06 [0.66, 1.70]	1.14 [0.68, 1.93]	1.06 [0.66, 1.70]	1.09 [0.66, 1.81]
Black	0.41 [0.16, 1.07] †	0.41 [0.16, 1.06] †	0.24 [0.08, 0.78] *	0.41 [0.16, 1.04] †	0.20 [0.06, 0.63] **
Latinx	1.89 [0.84, 4.25]	1.89 [0.84, 4.26]	1.77 [0.64, 4.87]	1.90 [0.84, 4.27]	1.67 [0.64, 4.40]
Arab	0.42 [0.17, 1.03] †	0.43 [0.18, 1.06] †	0.29 [0.09, 0.94] *	0.43 [0.17, 1.05] †	0.32 [0.11, 0.91] *
‘Other’	2.38 [1.12, 5.07] *	2.42 [1.15, 5.08] *	1.20 [0.56, 2.60]	2.40 [1.14, 5.03] *	1.27 [0.61, 2.63]
Binary FS status		1.20 [0.98, 1.48] †	1.13 [0.90, 1.42]		
Linear FS status				1.03 [0.99, 1.07]	1.02 [0.97, 1.06]
FS*White (ref.)					
FS*Indigenous			1.21 [0.66, 2.21]		0.99 [0.90, 1.09]
FS*Asian			0.70 [0.28, 1.73]		0.97 [0.78, 1.19]
FS*Black			3.10 [0.55, 17.5]		1.35 [1.02, 1.80] *
FS*Latinx			1.39 [0.31, 6.25]		1.20 [0.83, 1.75]
FS*Arab			5.53 [0.68, 44.6]		1.41 [0.95, 2.08] †
FS*‘Other’			14.56 [3.1, 69.5] **		1.68 [1.22, 2.31] **

Note. Block 1 omitted; Block 2 is identical for both models; Results for smoking status, alcohol use, and illicit drug use were omitted due to space constraints; Interaction terms correspond to method of modelling FS status, so these terms change when method of modeling changes (when model ‘resets’ between Blocks 4 and 5); Ref. = reference category; Mar./Com. law = Married or common-law; Wid./Sep./Div. = widowed, separated, or divorced; FS = food security.

† $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Table 19

Racial/Ethnic Identity as a Moderator of the Association Between Food Security (FS) Status and Number of Visits to a Mental Health Professional via Hierarchical Poisson Regression, for the Binary and Linear Measures of FS.

N = 59,530	Incidence Rate Ratio/SE				
		Binary Model		Linear Model	
	Block 2	Block 3	Block 4	Block 5	Block 6
Constant	168.84/41.90 ***	147.69/38.22 ***	146.97/38.34 ***	148.11/38.36 ***	146.52/38.26 ***
Age	0.97/0.00 ***	0.97/0.00 ***	0.97/0.00 ***	0.97/0.00 ***	0.97/0.00 ***
Sex	0.56/0.04 ***	0.56/0.04 ***	0.56/0.04 ***	0.56/0.04 ***	0.56/0.04 ***
< high school (ref.)					
High school	1.47/0.19 **	1.48/0.19 **	1.48/0.19 **	1.48/0.19 **	1.47/0.18 **
Post-secondary	1.67/0.19 ***	1.69/0.19 ***	1.69/0.19 ***	1.69/0.18 ***	1.69/0.18 ***
Mar./Com. law (ref.)					
Wid./Sep./Div.	1.40/0.13 ***	1.38/0.12 ***	1.38/0.12 ***	1.38/0.13 ***	1.38/0.12 ***
Single	0.97/0.09	0.97/0.09	0.97/0.09	0.97/0.09	0.97/0.09
Immigrant	0.87/0.16	0.88/0.16	0.88/0.16	0.88/0.16	0.88/0.16
Homeowner	1.02/0.08	1.05/0.08	1.05/0.08	1.06/0.09	1.06/0.09
Physical health	0.85/0.04 ***	0.86/0.04 ***	0.86/0.04 ***	0.86/0.04 ***	0.86/0.04 ***
Mental health	0.44/0.02 ***	0.45/0.02 ***	0.45/0.02 ***	0.45/0.02 ***	0.45/0.02 ***
Normal weight (ref.)					
Underweight	1.02/0.20	1.02/0.19	1.02/0.19	1.03/0.20	1.04/0.20
Overweight	0.98/0.08	0.98/0.08	0.98/0.08	0.98/0.08	0.98/0.08
Obese	1.01/0.08	1.00/0.08	1.00/0.08	1.00/0.08	1.00/0.08
Atlantic (ref.)					
Quebec	1.41/0.12 ***	1.42/0.13 ***	1.42/0.13 ***	1.43/0.13 ***	1.42/0.13 ***
Prairies	1.11/0.08	1.12/0.08	1.12/0.09	1.12/0.09	1.12/0.09

N = 59,530	Incidence Rate Ratio/SE				
		Binary Model		Linear Model	
	Block 2	Block 3	Block 4	Block 5	Block 6
British Columbia	1.44/0.14 ***	1.46/0.14 ***	1.46/0.14 ***	1.46/0.14 ***	1.45/0.14 ***
Territories	1.51/0.32 †	1.52/0.32 *	1.53/0.32 *	1.53/0.32 *	1.53/0.32 *
Children <18	1.20/0.07 **	1.19/0.07 **	1.19/0.07 **	1.20/0.07 **	1.20/0.07 **
Household size	0.79/0.03 ***	0.79/0.03 ***	0.79/0.03 ***	0.79/0.03 ***	0.79/0.03 ***
Income	1.00/0.00 †	1.00/0.00 †	1.00/0.00 †	1.00/0.00 †	1.00/0.00 †
White (ref.)					
Indigenous	0.91/0.10	0.90/0.10	0.93/0.13	0.89/0.10	0.92/0.12
Asian	0.57/0.13 *	0.57/0.13 *	0.57/0.15 *	0.57/0.13 *	0.54/0.13 *
Black	0.42/0.11 **	0.42/0.10 ***	0.38/0.10 ***	0.42/0.10 **	0.37/0.09 ***
Latinx	0.44/0.10 ***	0.44/0.10 ***	0.52/0.13 **	0.44/0.10 ***	0.49/0.12 **
Arab	0.64/0.18	0.64/0.19	0.76/0.24	0.65/0.19	0.64/0.21
‘Other’	0.64/0.15 †	0.64/0.15 *	0.69/0.19	0.64/0.15 †	0.67/0.18
Binary FS status		1.18/0.09 *	1.20/0.11 *		
Linear FS status				1.04/0.02 *	1.03/0.02 †
FS*White (ref.)					
FS*Indigenous			0.93/0.20		0.99/0.03
FS*Asian			1.01/0.39		1.07/0.08
FS*Black			1.24/0.57		1.07/0.08
FS*Latinx			0.56/0.23		0.91/0.07
FS*Arab			0.48/0.25		1.02/0.19
FS*‘Other’			0.79/0.34		0.97/0.08

Note. Block 1 omitted; Block 2 is identical for both models; Results for smoking status, alcohol use, and illicit drug use were omitted due to space constraints; Interaction terms correspond to method of modelling FS status, so these terms change when method of modeling changes (when model ‘resets’ between Blocks 4 and 5); Ref. = reference category; Mar./Com. law = Married or common-law; Wid./Sep./Div. = widowed, separated, or divorced; FS = food security.

† $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Table 20

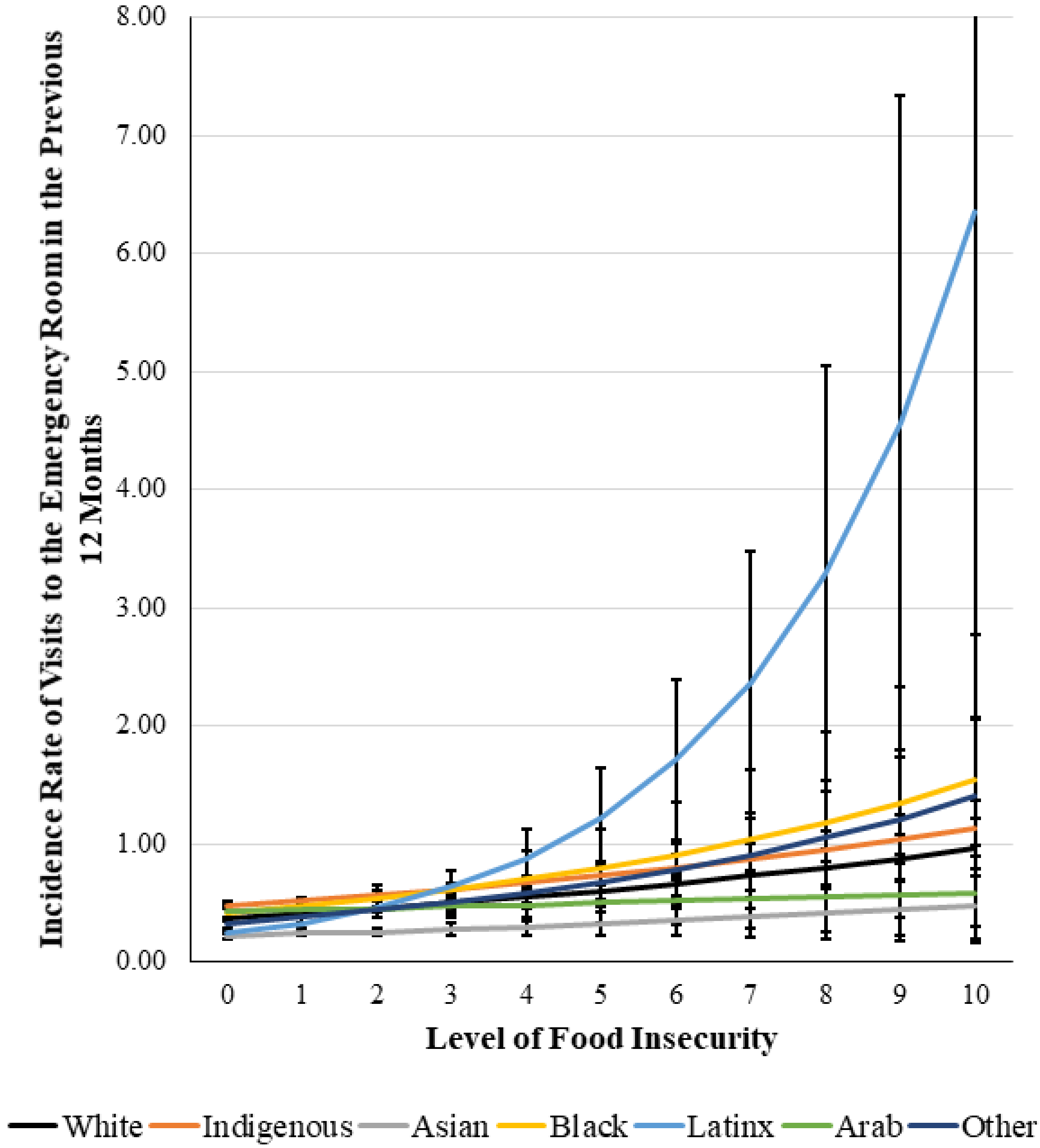
Summary for Support of Hypotheses for Research Questions 1, 2, 4, 5, 7, and 8.

	Hypothesis Supported?		
	Hypothesis 1	Hypothesis 2	
Healthcare Use Outcomes		Binary FS	Linear FS
Being hospitalized overnight	Not supported	Not supported	Supported
Number of overnight hospitalizations	Not supported	Not supported	Not supported
Number of emergency room visits	Partially supported	Supported	Supported
Number of visits to family doctor/GP	Not supported	Supported	Supported
Number of visits to medical specialists	Partially supported	Not supported	Not supported
Number of visits to a nurse	Not supported	Not supported	Not supported
	Hypothesis 3	Hypothesis 4	
Barrier to Care Outcomes		Binary FS	Linear FS
Source for immediate care	Not supported	Not supported	Not supported
Have regular care provider	Not supported	Not supported	Not supported
Problematic wait time – appointment	Partially supported	Supported	Supported
Problematic wait time – for minor need	Partially supported	Not supported	Not supported
Problematic wait time – consultation	Partially supported	Not supported	Not supported
Skip prescriptions due to cost	Not supported	Supported	Supported
	Hypothesis 5	Hypothesis 6	
Mental Healthcare Outcomes		Binary FS	Linear FS
Visit mental health professional	Partially supported	Supported	Supported
Visit family doctor/GP about mental health	Not supported	Supported	Supported
Visit a psychiatrist	Not supported	Not supported	Supported
Visit a psychologist	Partially supported	Supported	Supported
Visit a social worker or counsellor	Not supported	Not supported	Not supported
Number of mental health visits	Partially supported	Supported	Supported

Note. GP = general practitioner; Research Question 3, Research Question 6, and Research Question 9 did not have formal hypotheses; The six hypotheses that were tested are restated here as a reminder.
Hypothesis 1: Being a member of a racialized group would be associated with greater odds of using emergency healthcare services and decreased odds of using non-emergency care.
Hypothesis 2: FI would be associated with a greater likelihood of using healthcare services.
Hypothesis 3: Being a member of a racialized group would be associated with greater odds of facing barriers to accessing care.
Hypothesis 4: FI would be associated with a greater likelihood of facing barriers to accessing care.
Hypothesis 5: Being a member of a racialized group would be associated with decreased odds of using mental health services.
Hypothesis 6: FI would be associated with a greater likelihood of using mental health services.

Figure 1

Differences in the Number of Visits to the Emergency Room Across the Linear Measure of Food Security Status, by Racial/Ethnic Identity.



Note. The largest error bar for the linear measure (bottom) extends to 10.64 (omitted for scaling).

Figure 2

Differences in the Probability of Skipping a Prescription Dose or Refill Due to Cost Across the Binary Measure of Food Security Status, by Racial/Ethnic Identity.

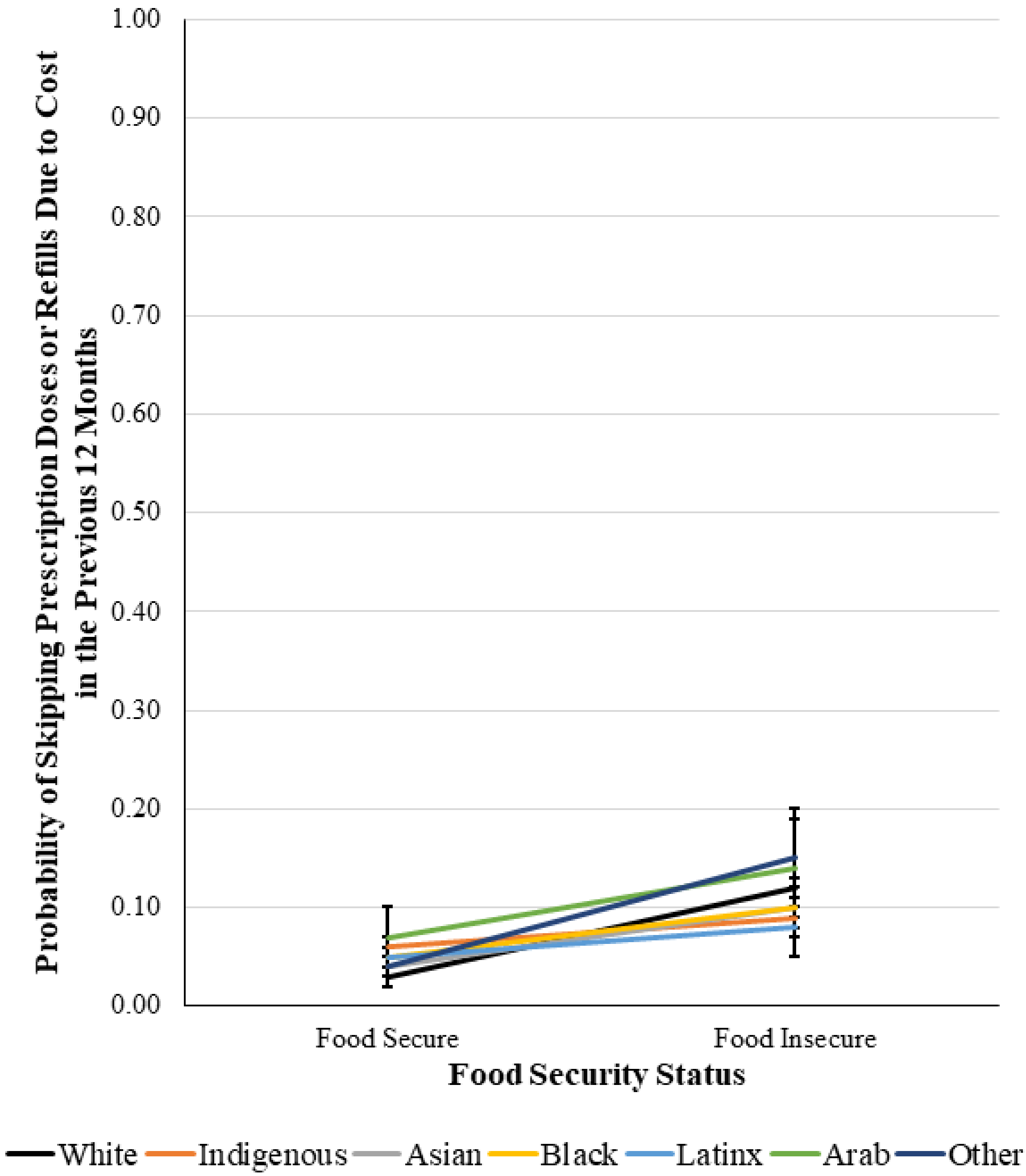


Figure 3

Differences in the Probability of Skipping a Prescription Dose or Refill Due to Cost Across the Linear Measure of Food Security Status, by Racial/Ethnic Identity.

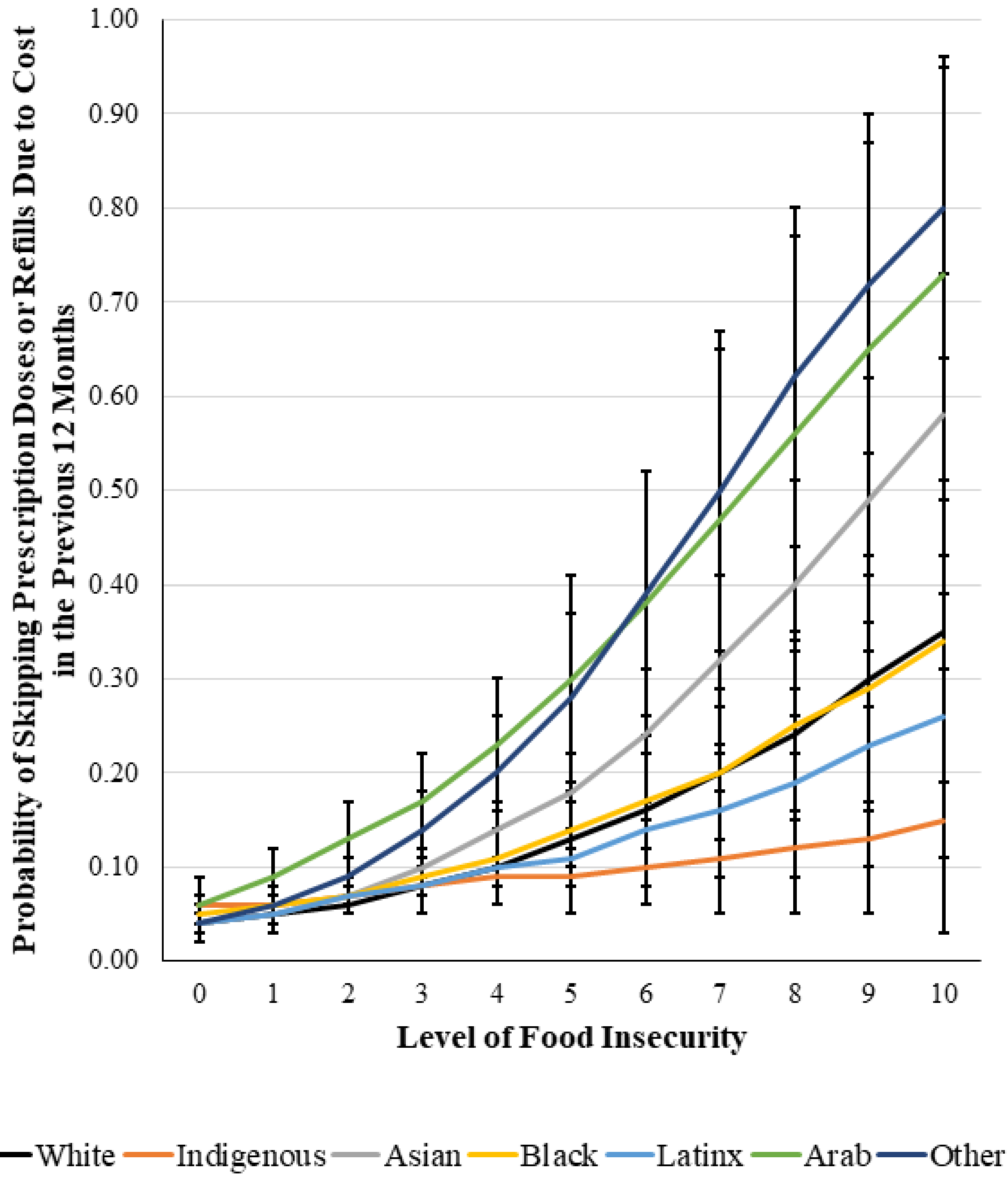
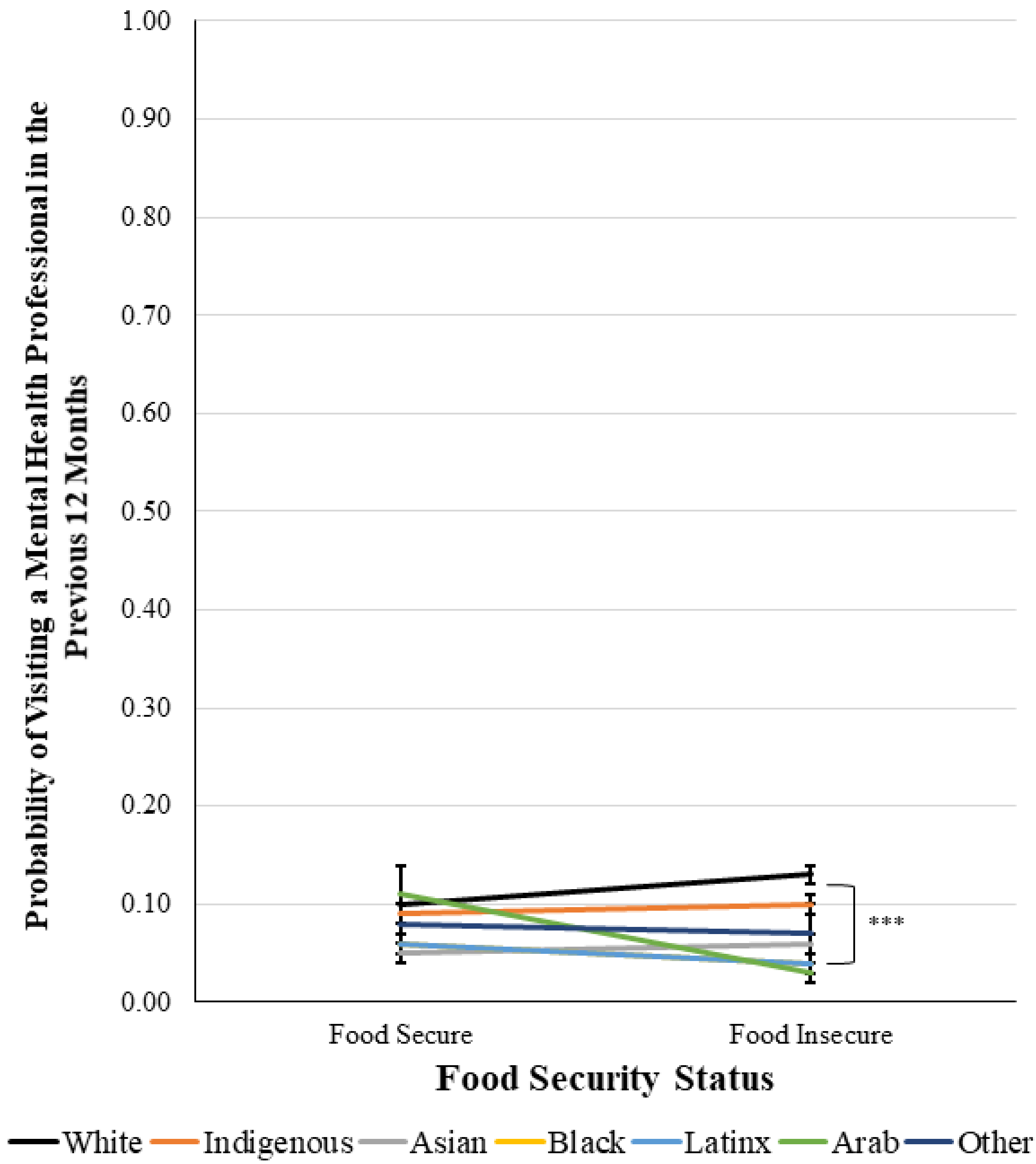


Figure 4

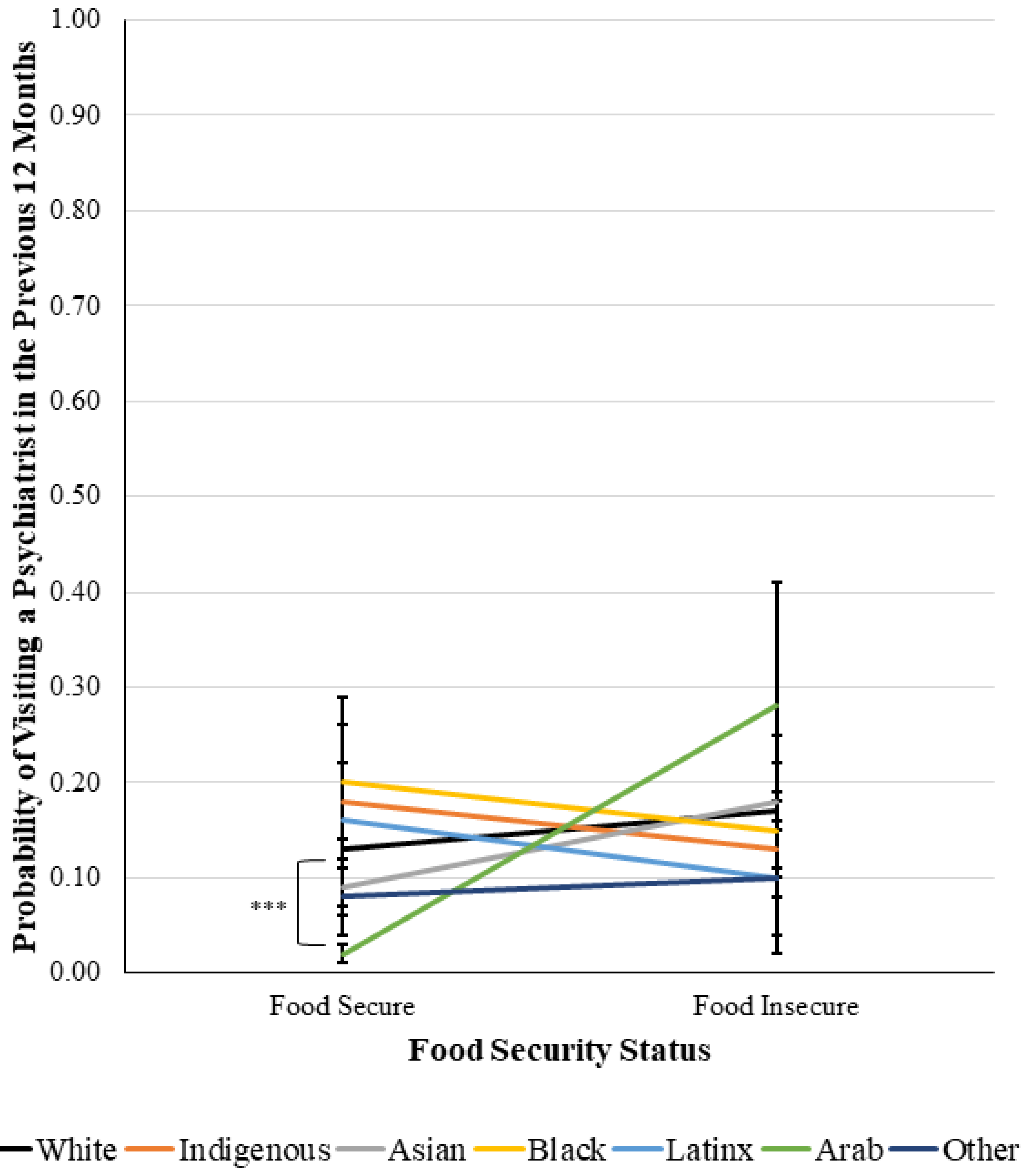
Differences in the Probability of Visiting a Mental Health Professional Across the Binary Measure of Food Security Status, by Racial/Ethnic Identity.



Note. A statistically significant difference was reported between respondents who were food insecure and White, and respondents who were food insecure and Arab.
*** $p < .001$

Figure 5

Differences in the Probability of Visiting a Psychiatrist Across the Binary Measure of Food Security Status, by Racial/Ethnic Identity.



Note. A statistically significant difference was reported between respondents who were food secure and White, and respondents who were food secure and Arab.
*** $p < .001$

Appendix A

Covariate Questions

Note: Questions marked with an asterisk (*) indicate variables that were part of derived measures.

1. What is your age?
2. Are you male or female?
3. What is the highest grade of elementary or high school you have ever completed?*
4. Did you complete a high school diploma or its equivalent?*
5. Have you received any other education that could be counted towards a certificate, diploma or degree from an educational institution?*
6. What is the highest certificate, diploma or degree that you have completed?*
7. What is your marital status?
8. Are you now, or have you ever been a landed immigrant in Canada?
9. Is your dwelling rented or owned?
10. In general, would you say your health is... [excellent, very good, good, fair, poor]?
11. In general, would you say your mental health is... [excellent, very good, good, fair, poor]?
12. Are you pregnant?*
13. How tall are you without shoes on?*
14. How much do you weigh?*
15. Was your weight in pounds or kilograms?*

16. At the present time, do you smoke cigarettes every day, occasionally or not at all?*
17. Have you smoked more than 100 cigarettes (about 4 packs) in your life?*
18. Have you ever smoked a whole cigarette?*
19. Have you ever smoked cigarettes daily?*
20. Have you ever had a drink in your lifetime?*
21. During the past 12 months, that is, from [date one year ago] to yesterday, have you had a drink of beer, wine, liquor or any other alcoholic beverage?*
22. During the past 12 months, how often did you drink alcoholic beverages?*
23. Have you ever used or tried marijuana or hashish in the past 12 months?*
24. Have you ever used or tried cocaine in any form, including crack, freebase, powder or snow in the past 12 months?*
25. Have you ever used or tried amphetamines, speed, methamphetamines or crystal meth in the past 12 months?*
26. Have you ever used or tried ecstasy, also known as MDMA, E, Xtc, Adam or X? in the past 12 months?*
27. Have you ever used or tried hallucinogens such as PCP, LSD, acid, magic mushrooms, mescaline or angel dust in the past 12 months?*
28. Have you ever sniffed glue, gasoline or other solvents to get high in the past 12 months?*
29. Have you ever used a needle to inject or be injected with a drug not prescribed by a doctor in the past 12 months?*
30. What is your province of residence?

31. What are the names of all persons who usually live in your household?*
32. What are their ages?*
33. What is your relationship with all persons who usually live in your household?*
34. What is your best estimate of your total household income received by all household members, from all sources, before taxes and deductions, during the year ending December 31, [current year - 1]? (Income can come from various sources such as from work, investments, pensions or government. Examples include Employment Insurance, Social Assistance, Child Tax Benefit and other income such as child support, spousal support (alimony) and rental income.)

Appendix B

Food Security Questions

1. You (and others) worried that food would run out before you got money to buy more. Was that often true, sometimes true, or never true in the past 12 months?
2. The food that you (and others) bought just didn’t last, and there wasn’t any money to get more. Was that often true, sometimes true, or never true in the past 12 months?
3. You (and others) couldn’t afford to eat balanced meals. In the past 12 months was that often true, sometimes true, or never true?
4. In the past 12 months, since last [current month], did you (and other adults) ever cut the size of your meals or skip meals because there wasn’t enough money for food?
5. How often did this happen?
6. In the past 12 months, did you (personally) ever eat less than you felt you should because there wasn't enough money to buy food?
7. In the past 12 months, were you (personally) ever hungry but didn't eat because you couldn't afford enough food?
8. In the past 12 months, did you (personally) ever lose weight because you didn't have enough money for food?
9. In the past 12 months, did you (and other adults) ever not eat for a whole day because there wasn't enough money for food?
10. How often did this happen?

Appendix C

Race/Ethnicity Questions

1. You may belong to one or more racial or cultural groups on the following list. Are you White, South Asian, Chinese, Black, Filipino, Latino American, Arab, Southeast Asian, West Asian, Korean, Japanese, or other (specify)?
2. Are you an Aboriginal person, that is, First Nations, Métis or Inuk (Inuit)? First Nations includes Status and Non-Status Indians.

Appendix D

Healthcare Utilization Questions

1. Excluding the time you spent in an emergency department, in the past 12 months, have you been a patient overnight in a hospital?
2. For how many nights in the past 12 months have you been an overnight hospital patient (excluding the time you spent in an emergency department)?
3. In the past 12 months, how many times have you personally used a hospital emergency room?
4. How many times (in the past 12 months) have you seen or talked to a family doctor or general practitioner?
5. How many times (in the past 12 months) have you seen or talked to [any other medical doctor or specialist such as a surgeon, allergist, orthopaedist, [urologist / gynecologist] or psychiatrist]?
6. How many times (in the past 12 months) have you seen or talked to a nurse?

Appendix E

Healthcare Barrier Questions

1. Is there a place that you usually go to when you need immediate care for a minor health problem?
2. Do you have a regular health care provider? By this, we mean one health professional that you regularly see or talk to when you need care or advice for your health.
3. When you need immediate care for a minor health problem, how long do you usually have to wait before you can have an appointment with this family physician / specialist / nurse practitioner / regular health care provider / or another care provider from the same office?
4. How quickly did you get your last consultation appointment?
5. Was the time you waited for your last consultation appointment a problem for you?
6. During the last 12 months, was there a time when you did not fill or collect a prescription for medicine, or you skipped doses of your medicine because of the cost?

Appendix F

Mental Health Service Use Questions

1. In the past 12 months, that is, from [date one year ago] to yesterday, have you seen or talked to a health professional about your emotional or mental health?
2. Whom did you see or talk to? – Family doctor or general practitioner.
3. Whom did you see or talk to? – Psychiatrist.
4. Whom did you see or talk to? – Psychologist.
5. Whom did you see or talk to? – Social worker or counsellor.
6. How many times (in the past 12 months) did you see or talk to a health professional?

Curriculum Vitae

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Publications:

Lamont, A., & Speed, D. (2022). *Examining the influence of depression on the associations between food insecurity and utilization of medical and mental health services.* Manuscript submitted for publication.

Speed, D., **Lamont, A.**, MacDonald, J., & Hwang, K. (2021). *Created sick, commanded to be well: Canadian atheists report health parity to non-atheists*. Manuscript submitted for publication.

Speed, D., & **Lamont, A.** (2021). *(Life) satisfaction guaranteed? Subjective wellbeing attenuates religious attendance-life satisfaction association.* Psychology of Religion and Spirituality. Advance online publication. https://doi.org/10.1037/rel0000443

Conference Presentations:

Lamont, A., & Speed, D. (2022, June). *Does race/ethnicity moderate the associations between food insecurity and health service trends?* [Oral presentation]. CPA 2022 National Convention, Calgary, AB.

Speed, D, MacDonald, J., King, T., Pronyk, T., **Lamont, A.**, Hall, C., & Smith, E. (2022, June). *Sex-based disparities in chores persists irrespective of employment status* [Oral presentation]. CPA 2022 National Convention, Calgary, AB.

Lamont, A., & Speed, D. (2022, May). Investigating racial/ethnic differences in the medical help-seeking behaviours of Canadians who are food insecure [Poster presentation]. UNB Graduate Research Conference 2022, Virtual.

Speed, D., & **Lamont, A.** (2021, October). (Life) satisfaction guaranteed? *Subjective wellbeing attenuates religious attendance-life satisfaction association* [Oral presentation]. Department of Psychology Colloquium, University of New Brunswick, Saint John, NB, Canada.

Lamont, A., & Speed, D. (2021, September). *Food insecurity and unmet healthcare needs: Comparing different methods of modelling food security status* [Oral presentation]. UNBSJ Faculty of Business Research Colloquium 2021-2022, University of New Brunswick, Saint John, NB, Canada.

Speed, D., & **Lamont, A.** (2021, August). *Controlling for physical health attenuates the relationship between religious attendance and life satisfaction* [Oral presentation]. UNB Health Research Conference, Virtual.

Lamont, A., & Speed, D. (2021, August). *Food insecurity, mental healthcare service use, and medical healthcare: The role of depression* [Oral presentation]. Collaborative Health Research Conference, Virtual.

Lamont, A., Speed, D., Hickey, P., & Beaulieu, D. (2021, June). *Food insecurity, mental healthcare service use, and medical healthcare: The role of depression* [Oral presentation]. CPA 2021 Virtual Convention.

Beaulieu, D., Best, L., **Lamont, A.**, & Speed, D. (2021, June). *Perceived physical and psychological health factors leading to unhealthy weight in Canadian men and women* [Poster presentation]. CPA 2021 Virtual Convention.

Lamont, A., & Speed, D. (2021, May). *Food insecurity, mental healthcare service use, and medical healthcare: The role of depression* [Oral presentation]. Science Atlantic Psychology Conference 2021, Virtual.

Speed, D., & **Lamont, A.** (2020, October). *Satisfaction Guaranteed? Self-rated health mediates relationship between attendance and satisfaction with life* [Oral presentation]. Fall 2020 Psychology Department Colloquium, Memorial University of Newfoundland, Virtual.

Academic Prizes:

SSHRC Canada Graduate Scholarships – Master's (2021-2022)
M.T Bradley Scholarship in Psychology (2021-2022)
Accelerated Master’s Scholarship (2021)
Barbara Elizabeth Fisher Founder Prize in Psychology (2021)
Science Atlantic Undergraduate Research Award (2021)
Beaverbrook Scholars Award (2017-2020)