Food security status of Zimbabwean immigrants living in Msunduzi municipality, South Africa during the COVID-19 pandemic

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ABSTRACT

The study aims to examine food security status of Zimbabwean immigrants living in Msundizi municipality, South Africa, during the COV-19 pandemic. A cross-sectional study design using a mixed-methods approach was adopted to collect data from 379 randomly selected Zimbabwean immigrants. Food security status was assessed using the Household Food Insecurity Access Scale. Data was analysed using descriptive statistics and logistic regression models. Most immigrants were males (66%), 52.2% were 18–38 years old, and 91.4% were employed. Most respondents (51%) had a tertiary education, and 35.9% earned between R3001 and R4500. The majority of immigrants (75%) were food insecure. Food insecurity was perceived to be due to reduced/loss of employment, socio-political factors such as theft, insecurity/violence, political crisis, lack of land ownership, and high food prices. The age, immigration status, and type of employment were associated with food insecurity. Food insecurity is prevalent among Zimbabwean immigrants living in Msunduzi municipality. There is a need for targeted food security policies that are aimed at increasing availability and access to food among immigrants. The SA government should extend food safety nets to all, regardless of citizen status.

Contribution/ Originality: Statistics have shown that Zimbabwean immigrants form the largest immigrant group in South Africa. Food security status of Zimbabwean immigrants living in Msunduzi Municipality and its determinants was investigated for the first time in this study. Therefore, this study contributes to the body of knowledge and could inform future programs.

1. INTRODUCTION

Globally, migration has been a consistent problem, with approximately 272 million international migrants and 25.9 million refugees displaced around the world (Kaplin, 2019). South Africa has emerged as the destination of choice for the majority of immigrants from Africa, especially Southern Africa, since the demise of the apartheid dispensation in 1995 (UN DESA, 2020). The majority of these immigrants come from neighbouring countries such as Mozambique, Malawi, Zambia, Lesotho, Eswatini, and Zimbabwe (Nshimbi & Fioramonti, 2013; Stats, 2023a). According to reports, in 2020 there were approximately 2.9 million migrants residing in South Africa. Political instability, environmental conditions, and poor economic prospects from countries of origin are the main drivers of migration in Southern Africa (UN DESA, 2020). In the 21st century, Zimbabwe has been plagued by severe poverty, the breakdown of social services, high unemployment, and hyperinflation (Mukoka, 2018). The synergy of these negative socio-economic aspects has forced many Zimbabweans to migrate to other countries, with a high influx into neighbouring countries

such as South Africa (SA). According to the Human Rights Watch (2008) there were approximately 1.5 million Zimbabweans that had entered and resided in South Africa illegally. This makes Zimbabwean nationals the largest immigrant group in South Africa. Zimbabweans in South Africa have traditionally settled and are concentrated in large cities such as Johannesburg, Pretoria, Cape Town, amongst others; however, now Zimbabweans can be found in all parts of South Africa (Theodore, Pretorius, Blaauw, & Schenck, 2018). The literature widely acknowledges the correlation between migration and food security. However, the extent to which migrants can meet their food security needs in resettled host areas or countries remains largely unexplored. There is accumulating evidence that suggests that immigrants are highly predisposed to food insecurity in the host countries relative to local populations. For example, in a scoping review conducted by Maynard et al. (2019) it was revealed that immigrants were more food insecure than native populations in the United States of America (USA) and Canada. Similarly, Walsemann, Ro, and Gee (2017) noted that Latinos and Asians living in California were more food insecure than USA-born citizens. Likewise in Norway, a study involving Syrian immigrants came to the same conclusion: immigrants tend to face severe food shortages (Kamelkova, 2021). The vulnerability of immigrants to food insecurity has been attributed to a lack of financial resources, language barriers, a lack of culturally acceptable food, and limited employment opportunities (Carney & Krause, 2020; Dweba, Oguttu, & Mbajiorgu, 2018) as well as limited awareness of the resources and services available in their host countries to address food insecurity (Carney & Krause, 2020).

Despite the high number of Zimbabweans immigrating to South Africa, only one study was found that has assessed the food security status of Zimbabweans living in South Africa (Crush & Tawodzera, 2017). Furthermore, the aforementioned study took place in Johannesburg and Cape Town more than five years ago. Therefore, data on the food security status of Zimbabweans living in South Africa is scanty and outdated. Besides, with regard to food security, evidence shows that due to heterogeneity in characteristics and contexts, area-specific studies are necessary.

The United Nations and Sustainable Development Goals state that by 2030 there should be zero hunger and there should be access by all people, to safe, nutritious, and sufficient food all year round. This also includes immigrants. Furthermore, lack of information pertaining to dietary patterns and food security challenges among immigrants, has the potential to negatively affect the health of this population and subsequently heighten the load on the South African health system. The following are the main research questions of this study: (i) What is the food security status of Zimbabwean immigrants living in South Africa? (ii) What is the socio-economic level of food insecurity among these immigrants? And what are the perceived causes of food insecurity amongst Zimbabwean immigrants? In the view of this, we hypothesize that Zimbabwean immigrants living in South Africa experience high levels of food insecurity, and there are demographic characteristics that predict food insecurity.

2. LITERATURE REVIEW

Several studies have shown that immigrants are usually more food insecure than their local counterparts (Alarcão et al., 2020; Maynard et al., 2019; Napier, Oldewage-Theron, & Makhaye, 2018). Previous literature indicates that immigrants are particularly vulnerable to food insecurity, and initiatives to improve their access to a nutritious diet are critical (Maynard et al., 2019). Poverty and income inequality in high-income countries contribute to the increased vulnerability of immigrants (Carney & Krause, 2020). For example, a study of Afghan immigrants in two Iranian cities revealed that 60% of respondents suffered from moderate-to-severe food insecurity versus 37% who were mildly food-insecure (Omidvar, Ghazi-Tabatabie, Sadeghi, Mohammadi, & Abbasi-Shavazi, 2013). Similarly, in the USA, a study of immigrant Latin Americans in urban areas showed that 48.2% had low food security and 7.8% had very low food security (Benites-Zapata et al., 2021). Contrary to these findings, Alarcão et al. (2020) in their study, which was conducted in Portugal, found no significant difference in the prevalence of food insecurity between immigrants and natives. According to literature, the food insecurity statistics of immigrants living in South Africa are no different from global trends (Crush & Tawodzera, 2017; Sibanda & Stanton, 2022). Crush and Tawodzera (2017) conducted a study that revealed high levels of food insecurity among Zimbabwean immigrants residing in Cape Town and

Johannesburg. In this study, it was established that migrant households were either moderately (24%) or severely food insecure (60%), while most of them had low dietary diversity score. It is important to note that these figures are almost double the South African national figures of 6,8 million, 15,8% being inadequate, 5.5% being severely inadequate, and 78.7% being adequate (Maharaj, Tomita, Thela, Mhlongo, & Burns, 2017). Napier et al. (2018) also observed similar results in their study that was conducted amongst women asylum seekers living in Durban, revealing that majority (92.6%) of participants were food insecure. This was further confirmed by Sibanda and Stanton (2022) in their study that examined socio-economic challenges experienced by immigrants in South Africa, who reported that immigrants experience financial insecurity and underemployment.

Based on the contradictions in findings alluded to in the preceding section, it is clear that food insecurity situation of immigrants may vary from country to country. Therefore, there is a need for country-specific data to ascertain vulnerability to food insecurity amongst immigrants living in South Africa.

3. MATERIALS AND METHODS

3.1. Study Area, Design and Sampling

The study was carried out in the city of Pietermaritzburg (PMB) in the KwaZulu-Natal (KZN) province of South Africa. Pietermaritzburg (Figure 1) is the provincial capital of KZN and the second largest city in KZN after Durban. Pietermaritzburg forms part of Msunduzi local municipality. The city is known as one of the major producers of aluminium, timber, and dairy products in the KwaZulu-Natal province. It also serves as the central economic point, thus attracting a number of internal and external immigrants.

A cross-sectional mixed methods design was employed to answer the objectives of this study. The target population was restricted to all the Zimbabwean immigrants over the age of 18 living in Pietermaritzburg. However, there is no consensus on the exact number of Zimbabweans living in South Africa (Crush & Caesar, 2016; Theodore et al., 2018); reports indicate that they are approximately 1.5 million (Crush & Tawodzera, 2017; De Jager & Musuva, 2016; Theodore et al., 2018). Literature suggests that 8% of immigrants residing in South Africa are located in KwaZulu-Natal (Sibanda & Stanton, 2022). This led to an estimate of approximately 120 000 immigrants residing in KwaZulu-Natal. Furthermore, statistics also indicate that 36.8% of permits were issued to Zimbabweans (Stats, 2013). Therefore, this suggests that there are approximately 44, 400 Zimbabweans distributed in the entire KwaZulu-Natal province. Therefore, 44, 400 was considered the population of Zimbabweans residing in KwaZulu-Natal.

The formula by Krejcie and Morgan (1970) and Research Advisors (2006) was used to determine the sample size. Based on this formula, sample size was set at 379. Respondents were recruited by posting notices on various platforms such as social media, local businesses including grocery shops, immigrant businesses, churches, hair salons, parking lots (targeting car guards), and domestic worker communities according to recommendations made by Napier et al. (2018) and Crush and Tawodzera (2017). Out of those who responded to the call, 1215 Zimbabwean immigrants met the inclusion criteria. Their names were taken down, and a sample of 379 respondents was randomly selected to participate in the study.

Data was collected during the period of 01 June 2022 to 30 June 2023. Two data collection instruments were used in this study, namely a structured questionnaire and focus group discussions. Information was gathered amid the COVID-19 outbreak, and to comply with COVID-19 restrictions during the early days, the questionnaire was administered by the researcher using video calls such as Zoom, WhatsApp, and Google Meet to minimise contact between the respondents and the interviewer. Later, when the restrictions were lowered, questionnaires were administered face-to-face. This then covered participants that might not have had access to the above-mentioned online applications.

Figure 1. Map of Pietermaritzburg.

Source: https://www.worldmap1.com/map/pietermaritzburg-map

The study was approved by the College of Agriculture and Environmental Science's Health Research Ethics Committee (HREC), University of South Africa (UNISA), South Africa, on the 06th December 2021 (Ref #:2021/CAES HREC/176), before the data collection commenced.

Food security was evaluated utilizing the Household Food Insecurity Access Scale (HFIAS). HFIAS is a standardized food security assessment tool that consists of nine occurrence questions. As recommended by Coates, Swindale, and Bilinsky (2007) HFIAS was used to assess food access by asking respondents how often they worried about having access to food in the past 30 days reference period. Scores of individual households are then computed and can range from 0 −27 (Coates et al., 2007; Maxwell, Vaitla, & Coates, 2014). According to Coates et al. (2007) a lower score is indicative of food security while a higher score is an indicator that the household is food insecure. Maxwell et al. (2014) advised us to compute these scores and use them to group the respondents into 4 categories of food security.

Perceptions of households on the different causes of food insecurity were assessed using a Likert scale. Perceptions ranged from an inability to find employment, loss of employment, reduction in household income, sickness or death of working member of the household, health expenses, high food costs, sending remittances home, amongst other reasons. The list of possible causes of food insecurity was compiled from existing literature (Crush & Tawodzera, 2017).

Focus group discussions were used to collect data on causes of food insecurity in this study to explore and triangulate the information collected by a Likert scale. For this purpose, a list of open-ended probing questions was developed. The focus of these probing questions was to gather additional and secondary information on sources of food, and possible causes of food insecurity. A total of three (3) focus groups were held using the saturation as a guiding principle.

3.2. Data Analysis

Qualitative data was analysed thematically. Quantitative data was captured in an Excel spreadsheet, cleaned, and cross-checked for abnormalities. Socio-demographic data was first analysed using the Statistical Package for the Social Sciences (SPSS), version 27.0, to perform descriptive analysis.

To assess the association between independent variables and outcome variable (household food insecurity status), a binary logistic regression model was used. The logistic regression function models the likelihood that the dependent variable is a result of a set of predictor variables $X = [X_1, X_2, ..., X_P]^T$ and regression coefficients $\beta = [\beta_0, \beta_1, ..., \beta_p]^T$ as given by the equation below:

$$\pi(x) = \left[\frac{eB_0 + B_1 X^1 + B_2 X^2 + \cdots + B_P X_P}{1 + eB_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots + BpXp} \right]$$

As explained by Midi, Sarkar, and Rana (2010) binary logistic regression is used when the outcome variable is dichotomous in nature. In this study, the outcome variable was HFIAS. HFIAS was reclassified into a dichotomous variable as suggested by several authors (Mncube, Ojo, & Nyam, 2023; Mota, Lachore, & Handiso, 2019; Nkoko, Cronje, & Swanepoel, 2024). An outcome of "not being food insecure" was represented by 0, whereby the outcome of "being food insecure" was represented by 1. The independent (Y) variables were discrete since data fits into a named group, which does not represent any kind of order or scale.

By following Harris (2021) the equation of the binary logistic regression model is as follows:

$$P(y) = \frac{1}{1 + e^{-1(\beta_0 + \beta_1 X_1 + \beta_2 X_2)}} \quad (1)$$

Where P(y) is the probability of one category (often the presence of a behaviour or condition) of the dependent variable Y (the Y above can be either 1 or 0, depending on the score of ith household on the dependent variable). The β represents the coefficients of the independent variable, and X stands for the independent variables.

Univariate analysis to identify independent variables significantly associated with the dependent variable at a cut-off point of $p \leq 0.20$ was performed as part of model-building process. Thereafter, a manual backward selection method was used to fit a multivariable binary logistic regression model, by inputting all the variables that are significantly associated with the dependent variable in the univariate analysis. Confounders were tested in the model by assessing the measure of association before and after adjusting for a potential confounding variable. A particular variable was confirmed a confounder when the estimated measure of association varied by more than 10%. All confounding variables were kept in the model irrespective of whether they were significant or not. Multicollinearity was evaluated by computing the Variance Inflation Factor (VIF) and tolerance values. All the independent variables had VIFs of less than 3 and tolerance values greater than 0.20. These confirmed that multicollinearity was not a problem. The Omnibus test was performed to evaluate the model's goodness of fit. It was evident from the likelihood ratio chi-square tests that the model with the predictors fits the data more appropriately than the null model [$x^2(20) ==77.619; p=0.001$]. In addition, the Hosmer-Lemeshow (HL) test was performed to assess the goodness of fit of the model, and the results showed that the model fit the data well [$x^2(8) =1.586; P=.991$]. Statistical significance was assessed at α=0.05.

Due to insignificant numbers in some categories, the following independent variables were recoded before running a regression analysis as follows:

Age= 0=below 31 years; 1=32–38; 2=39–45 years; 3=46–52 years; 4=53–59years; 5= over 60 years.

Number of children=0=none; 1= 1 child; 2= 2 and above.

Education level=0=Primary; 1=O-level; 2=A-level; 3=Diploma; 4=Bachelor; 5=Prefer not to say.

Income=0= Less than R2500; 1=R2501–R3000; 2=R3001–R4500; 3= R4501–R5500; 4=Over R5501.

4. RESULTS

4.1. Demographic Information of the Respondents

Table 1 presents the demographic information. The majority 95% (n=360) of the participants were Shona. Most participants, 33.5%; (n=127) were between 32 and 38 years of age; followed by 19% (n=72) that were between 39 and 45 years. Only 10% of respondents were aged 53 years and older.

Over two-thirds 70% (n=266) of the respondents were male-headed households. The majority of the respondents were married, 70% (n=266) while 23.2% (n=88) were single. The majority of respondents, 70% (n=265) had children, with most participants, 38% (n=144) having between 2–4 children.

In terms of duration of stay (Table 1), the majority 60.7% (n = 230) of the respondents had been residing in South Africa for at least 10 years; only a small percentage had been in South Africa for less than 3 years, 0.8% (n= 3). With regard to immigration status, the majority, 94.7% (n=359) of the respondents, were documented immigrants, 4.7% (n =18) were of refugee or asylum status, and 0.5% (n = 2) were undocumented.

Table 1. Demographic information of the respondents (N=379).

Variable	Level	Frequency (n)	Percentage (%)
Cultural group	Shona	360	95
	Ndebele	17	4.5
	Other	2	0.5%
Age	18–24	62	16.4
	25–31	9	2.4
	32–38	127	33.5
	39–45	72	19.0
	46–52	70	18.5
	53–59	32	8.4
	> 60	7	1.8
Gender of the household head	Male	250	66
	Female	129	34
Marital status	Married	266	70.2
	Single	88	23.2
	Divorced	11	2.9
	Widowed	7	1.8
	Prefer not to say	7	1.8
Number of children in the household	None	109	28.8
	1	122	32.2
	2–4	144	38.0
	>4	4	1.1
Duration of stay in SA	1–3 years	3	0.8
	4–6 years	43	15.4
	7–9 years	94	24.8
	At least 10 years	230	60.7
	Not indicated	9	2.4
Immigration status	Documented	359	94.7
	Refugees and Asylum seekers	18	4.7
	Undocumented	2	0.5

4.2. Socio-Economic Profile of the Participants

Table 2 provides the socio-economic profiles of the participants. Most respondents, 34.8% (n=132) in this study, had attained a diploma level of education, followed by 28.8% (n=109) who had secondary education. Respondents who had only primary education and those with postgraduate studies formed the least number at 4.0% (n=15) and 4.2% (n=16) respectively. Three quarters of the participants from the households included in the sample were employed, with 74.9% (n=284) working full-time while 17.4% (n=66) described their employment as part-time.

The majority, 72.3% (n=274) of the households, were employed in semi-skilled jobs, while 27.5% (n = 105) had blue-collar jobs (Table 2).

Table 2 provides the monthly household income level. All participants interviewed earned more than R1500 per month. Most respondents, 35.9% (n=136), in this study earned between R3001–R4500 and a few respondents, 7.1% (n=27) had an income of between R5501 and R6500. Only 7.4% (n =28) of respondents owned houses. The majority,

92.6% (n =351), were living in rented homes. Of these, 96.8% (n =367) lived in formal structures, while 2.4% lived in informal structures, and the remainder of 0.8% (n =3) did not disclose the type of housing they lived in.

The majority, 71.8% (n=272) respondents, indicated they received support from members outside the household, while 28.0% (n =106) did not receive and 0.3% (n =1) did not disclose that information. Fourteen respondents, 3.7% (n =14) indicated they received social service support in the form of food, while 3.4% (n= 13) indicated they received other social service support, and 92.9% (n= 352) did not disclose whether they received social service support.

Table 2. The socio-economic profile of participants (N=379).

| Variable	Level	Frequency (n)	Percentage (%)
Education level	Primary	15	4.0
	'O' level	109	28.8
	'A' level	50	13.2
	Diploma	132	34.8
	Bachelor's degree	57	15.0
	Postgraduate degree	16	4.2
Employment status	Full-time	284	74.9
	Part-time	66	17.4
	Seeking opportunities	2	0.50
	Preferred not to say	27	7.1
Type of employment	Semi-skilled jobs	274	72.3
	Blue collar jobs	105	27.5
Household income	R1501–R2500	4	1.1
	R2501–R3000	51	13.5
	R3001–R4500	136	35,9
	R4501–R5500	103	27.2
	R5501–R6500	27	7.1
	>R65001	58	15.3
Tenancy status	Owned	28	7.4
	Rented	351	92.6
Type of household structure	Informal structure	9	2.4
	Formal structure	367	96.8
	Did not disclose	3	0.8
Support from members outside family	Received support	272	71.8
	Did not receive support	106	28
	Did not disclose	1	0.3
Social service received	Received support in form of food	14	3.7
	Received other service support	13	3.4
	Preferred not to say	352	92.9
Household food production	No	329	86.6
	Yes	49	12.9
	Total	378	99,7
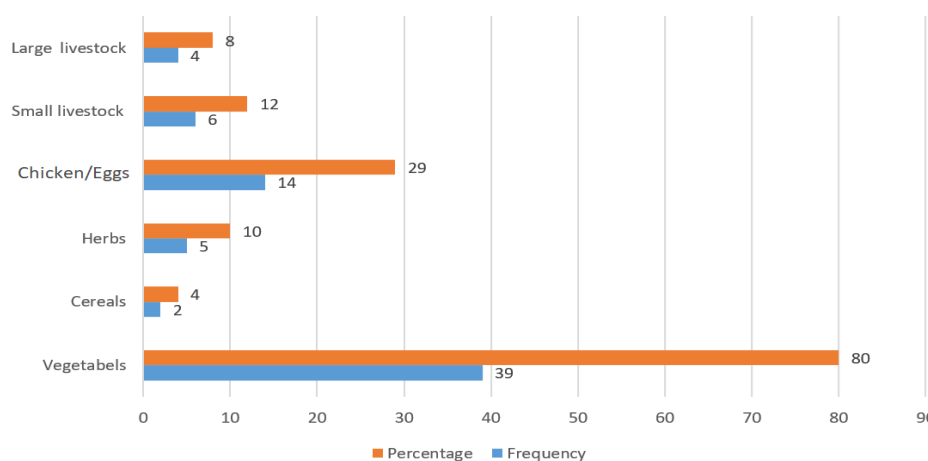
Figure 2. Food production activities by participants.

Note: The total percentages exceed 100% due to the allowance for multiple responses.

Furthermore, the results (Table 2) also showed that only 12.9% (n = 49) of the respondents were involved in some kind of own food production. Vegetables (80%), chickens and eggs (29%), and small stock animals (12%) were the main food types produced, as shown in Figure 2. Very few respondents indicated they also produced herbs (10%), large stock (8%) and cereals (4%).

4.3. Household Food Insecurity Access Scale (HFIAS) Categories

With regard to food security (Figure 3), results showed that 25% (n=95) of the participants experienced food security, whilst 75% were food insecure at varying levels, 14% (n=53) experienced mild food insecurity, 33% (n=126) and 28% (n=105), were moderately and severely food insecure, respectively and as illustrated in Figure 3.
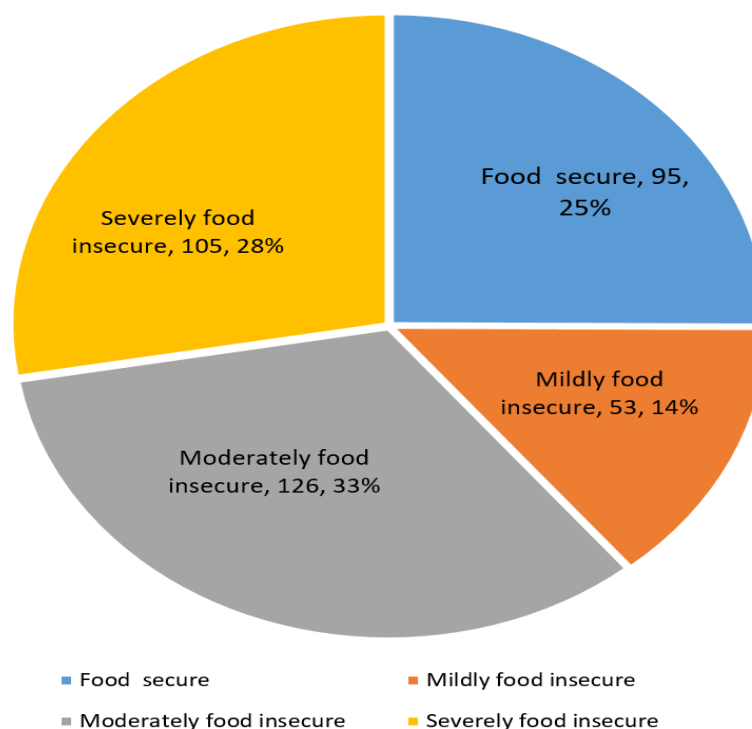

Figure 3. Prevalence of food insecurity levels amongst the Zimbabwe immigrants in Pietermaritzburg.

4.4. Perceived Causes of Food Insecurity

A Likert scale was used to assess the perceived causes of food insecurity and is presented in Table 3. The eighteen probable causes of food insecurity were grouped into five categories: (i) income/employment-related factors, (ii) social and political factors, (iii) family dynamics, and (iv) economic and environmental factors.

With regard to income and employment factors, most respondents (54.3%) disagreed that inability to find employment contributed to food insecurity. This was evidenced by the proportion of "disagree" and "strongly disagree." However, majority of participants (65.2%) conceded that loss of employment is a contributing factor to food insecurity, as shown by proportions of "agreed" 38.8% and "strongly agreed" 26.4%. In agreement with these results, during the focus group discussions there was consensus that Zimbabweans are food insecure.

"We suffer from hunger due to our little incomes. It then becomes difficult to buy adequate food, especially because we also do not have land to cultivate our own food. Unemployment leaves us without the means to afford enough food. Hunger persists without employment opportunities, financial resources, or food access."

A similar trend was observed for reduced employment, with nearly a half of the respondents, 73.4% agreeing that reduced employment resulted in food insecurity.

Across the social and political factors (Table 3), majority (88.2%) of respondents perceived food prices to be the most significant contributor to food insecurity. None of the participants disagreed in any way that high food prices contributed to food insecurity. One participant had this to say:

"The surging prices have become overwhelming. Budgeting has become nearly impossible due to these continual increases. Reflecting on my arrival in South Africa a decade ago, the landscape was markedly different. I recall purchasing a loaf of bread for a consistent price of R5.30 for well over a year without any fluctuations. However, the current situation is starkly contrasting. Selecting an item from the shelves now carries the risk of a shocking total at the checkout. While these increases may be less severe than those back in my home country, they still present significant challenges and have made the standard of living unaffordable."

The other important contributors of food insecurity under this category were insecurity /violence (65.4%), lack of land ownership (64.1%), and theft (54.9%). This is in line with the results of the focus group discussions, where one of the participants pointed out that:

"Theft rates in our residential neighbourhoods tend to be elevated, placing us at risk as potential targets. We are particularly vulnerable to theft due to being foreigners and our migrant status. Consequently, we find ourselves allocating more funds towards replacing stolen belongings rather than purchasing essential household provisions."

The family dynamic factors included sickness of working member of household, death of household member, health expenses, sending remittances home and age of household head. The results showed that respondents viewed sending remittances back home (70.2%), sickness of the household head (52.5%) as other main contributors to food insecurity.

Under other economic and environmental factors, the results showed that majority (67.5%) perceived increased costs of water and electricity as one of the main causes of food insecurity. From the focus group discussion, a participant said,

"The other issue revolves around the exorbitant electricity tariffs, which severely strain our finances. We refrain from cooking dishes like beans and tripe due to their higher energy consumption. Despite earning supplemental income from occasional gardening, laundry services, and selling various fruits and vegetables, it falls short of covering essential expenses such as food, electricity bills, and school fees. In the event of unemployment, the situation exacerbates, leaving us unable to afford basic necessities and going to bed hungry."

Environmental crises (47.2%) and the absence of the local markets (43%), respectively, cam next.

Table 3. Perceived causes food insecurity.

Category	Variable	Proportion of the respondents (%)				
		Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Income/ Employment related factors	Unable to find employment	1.1	13.7	39.6	19.3	26.4
	Loss of employment	2.9	6.9	25.1	38.8	26.4
	Reduced salary	0	4.7	21.9	50.7	22.7
Social & political factors	Theft	3.2	12.7	29.3	19.5	35.4
	Political crises	4.0	11.3	21.9	29.0	33.8
	Lack of land ownership	10.3	15.3	10.3	37.5	26.6
	High food prices	0	0	11.9	36.7	51.5
	Violence	3.2	5.0	26.4	23.7	41.7
Family dynamics	Sickness of the working member	1.3	25.6	20.6	28.2	24.3
	Death of the working household member	14.8	18.7	17.9	22.4	26.1
	High health expenses	2.9	19.5	29.6	31.9	16.1
	Sending remittances back home	3.2	21.9	4.7	17.2	53.0

Category	Variable	Proportion of the respondents (%)				
		Strongly disagree	Disagree	Neutral	Agree	Strongly agree
	Unable to work due to the age of the household head	3.7	34.8	29.8	17.2	14.5
Other economic and environmental factors	Unavailability of the local market	4.8	18.7	33.5	29.8	13.2
	Lack of information on nutritious food	7.9	31.9	24.3	26.9	9.0
	Environmental crises	7.7	15.0	30.1	32.2	15.0
	Increased cost of water and electricity	4.2	13.5	14.8	28.2	39.3
	Others	0	1.8	5.8	4.7	11.6

4.5. The Socio-Demographic Factors Associated with Food Security

Logistic regression (Table 4) was used to analyse the relationship between seven (7) socio-demographic characteristics, namely education status, age, tenacity, immigration status, household income, own food production, social services received, employment type, immigration status, household income, employment type, and number of children per household variables on food security status.

The results of the binary logistic model revealed that 1 out of seven (7) independent variables (age) were statistically significant at a 5% (p<0.5) level, while one (2) (immigrant status and employment type) was marginally significant at 10% (p<0.10) level (Table 4).

The variable age was found to be significant. The study found that respondents that are 60 years and older are (p<0.053) likely to be food secure compared to those that are aged between 25−31 years.

In terms of immigrant status, documented immigrants were likely (p<**0.081**) to be food secure compared to refugees and asylum seekers.

Likewise, employment type was negatively correlated at a 10% level (p<0.099) with food security. This means that respondents that are in blue-collar jobs have a smaller chance of being food secure compared to those that are in skilled jobs. Surprisingly variables such as income and education were not correlated with food security.

Table 4. Logistic regression analysis results.

Variable	Coefficients B	AOR	P value	95% CI	
				Lower	Upper
Constant	−1.095	0.335	<0.001		
Education Reference point=Primary education					
O-level	0.605	1.831	0.498	0.318	10.522
A-level education	−0.388	0.678	0.696	0.097	4.738
Diploma	0.803	2.233	0.317	0.385	12.962
Bachelor	1.139	3.125	0.237	0.473	20.626
Prefer not to say	2.256	9.542	0.0152	0.436	208.754
Age Reference point=25−31 years of age					
32−38 years	−0.207	0.813	0.880	0.055	12.036
39−45	−0.185	0.831	0.716	0.307	2.251
46−52	−0.595	0.552	0.306	0.177	1.723
53−59	0.316	1.372	0.559	0.475	3.959
>60	1.219	3.384	0.053*	0.984	11.631
Preferred not to say	1.321	3.746	0.250	0.395	35.492
Household income Reference point= Over R5501					
< R2500.00	−20.705	0.000	0.997	0.000	
R2501−R3000	0.368	1.445	0.406	1.445	3.440
R3001−R 4500	0.089	1.093	0.842	1.093	2.611

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Variable	Coefficients B	AOR	P value	95% CI	
				Lower	Upper
R4501–R5500	0.669	1.953	.233	1.953	5.867
Tenacity Reference point=Owned					
Rented	1.22	1.130	0.833	0.362	3.526
Type of employment Reference point= White collar					
Blue collar	-0.621	0.537	0.099**	0.257	1.124
Immigration status Reference point= Refugee & asylum seeker					
Documented	2.088	8.967	0.081**	78.955	1.018
Number of children Reference point=No children					
1 child	-0.334	0.716	0.431	0.312	1.644
>2 children in the household	0.027	1.027	0.947	0.464	2.275

Note: *Significant at p < 0.05.
**Marginally significant at 0.05 < p < 0.10.

5. DISCUSSION

Pietermaritzburg, like most cities in South Africa, is home to immigrants from Zimbabwe who face a number of challenges, including food insecurity. Whilst food security is a basic human right globally as well as enshrined in the South African constitution (Moyo & Thow, 2020) most families in South Africa are food insecure (Abrahams, Lund, Field, & Honikman, 2018). Compared to other inhabitants of any place, migrants are often at a higher risk of food insecurity because of several socio-economic and political factors in both the receiving country and their country of origin.

In line with previous reports from Stats (2020) in this study, the majority (71.2%) of respondents were 45 years and younger. People migrate in search of greener pastures where they can work and support their families back home in their country of origin. It is therefore expected that those who leave their countries in search of work opportunities or better livelihoods are the economically active age group, which was the predominant age of participants observed in this study. Previous studies have also reported similar results. For example, in their survey of Zimbabwean immigrants in South Africa, Crush and Tawodzera (2017) observed that the members of the surveyed households were all relatively young, with 75% younger than 40 years of age. Similarly, Ghazal and Bozoğlu (2022) also revealed that the majority of immigrants in their study that was conducted in Turkey were 45 years and younger.

The majority of immigrants (66%) were males in the current study. Reports indicate that more males than females received immigrant permits (Stats, 2015) which led to the anticipated outcome. In support of this, Crush and Tawodzera (2017) argue household heads are usually the first to migrate while the rest of the family remains behind. Consistent with previous studies conducted in South Africa (Maharaj et al., 2017) most respondents in this study were married. This is encouraging as being married is often associated with improved food security prospects (Sekhampu, 2017). Most respondents (54%) in this study had a tertiary education. This level of education amongst immigrants is reflective of the economic hardships in the original country (Zimbabwe), where the unemployment rate is high and the economy is not thriving (Mhlanga & Ndhlovu, 2021). According to Pretorius and Blaauw (2015) most immigrants from Zimbabwe are economic migrants seeking better employment opportunities to earn an income and support their families.

Contrary to previous studies Napier et al. (2018) and Maharaj et al. (2017) the majority (92%) of immigrants in this study were employed. The difference between these studies is probably because these other studies focused mainly on refugees and asylum seekers. These immigrant groups are usually more vulnerable to unemployment than other immigrant groups due to difficulties in accessing documentation, non-recognition of their qualifications, and language barriers (Weideman & Stander, 2012). As seen in this study, a significant proportion of immigrants in other parts of South Africa were observed to work in semi-skilled jobs within the services industry, including domestic work,

security, and truck driving. Additionally, some are engaged in providing services such as hairstyling and cell phone access. There are some migrants who work as artisans, particularly in crafting handmade goods (Crush & Tawodzera, 2017).

Furthermore, the majority of immigrants earned R5500 and below. While it is encouraging that none of the respondents in this study earned below R1500, which is the minimum wage in South Africa (Francis & Webster, 2019) this income is fairly low considering that most participants had relatively high literacy rates. In addition to this, these income levels are below the South African average income of ZAR25,304/month (Writer, 2023). Furthermore, in South Africa, the average cost of a household food basket in 2020 was ZAR4 018,22 (Pietermaritzburg Economic Justice and Dignity Group, 2020). The term food basket is used to refer to the collection of essential food items that are necessary for dietary patterns of individuals or households. Considering that the food basket excludes other household necessities such as electricity, accommodation, transport, etc., these salaries suggest that the sampled population could be susceptible to food insecurity.

The majority (60.7%) of the respondents have been residing in South Africa for no less than 10 years, which is a considerable time for households to settle and establish their lives in the country they would have emigrated into. The results therefore suggest that the majority of Zimbabwean immigrants are long-term immigrants, and this puts them in a better position to access food and cope with food security challenges (Adda, Dustmann, & Görlach, 2022). Furthermore, the majority of the participants (94.7%) had documented immigration status, which again puts them in a better position to seek employment and earn an income to provide food for themselves and their dependent families. The South African Immigration Act (South Africa. Immigration Act 13 of 2002, 2002) allows documented asylum seekers to seek employment and be employed in the labour market. For skilled employment, participants would require special work permits to qualify (Carciotto, 2018).

The findings of this study indicated that most participants resided in rented formal housing units. This was encouraging because formal housing structures presumably have the required facilities to enable them to conveniently prepare food and meals for their families (Crush & Tawodzera, 2017).

Growing and producing own food is generally considered a strategy to overcome food insecurity challenges, particularly in low- to medium-income countries (Edmondson et al., 2019). Other studies have observed that households that produce their own food are better equipped to access food (Edmondson et al., 2019). In many countries in Africa (Adekunle, 2013; Mbombo-Dweba, Mbajiorgu, Agyepong, & Oguttu, 2017) and globally (Edmondson et al., 2019) home gardens and backyard livestock rearing systems are used to improve household food security. However, in this research, the majority (86.8%) of the respondents did not grow their own food. This could be detrimental to food security outcomes, especially when considering the low incomes of respondents in this study. There are many possible reasons why the majority of the participants did not produce their own food. Firstly, Pietermaritzburg is an urban area with limited land to undertake its own food production. Secondly, as indicated earlier, the majority of the participants lived in rented houses and would possibly not have access to land to produce their own food (gardening or livestock rearing). These results suggest that the Zimbabwe immigrants in Pietermaritzburg, like most South Africans, are dependent on retail shops to access food, which then makes them susceptible to price fluctuations.

The observation that the majority (71.8%) of the participants received support from members outside the household implies that households did not solely depend on the income they generate to meet their day-to-day livelihoods, including food. This is a positive observation, as it increases their capacity to access food beyond their individual economic statuses. The role of remittances to support less disadvantaged family members and relatives has been reported amongst Zimbabweans, particularly when in their home country (Nyikahadzoi, Dzingirai, Zamayisa, Quarshie, & Warinda, 2019). Only citizens of South Africa receive social support services, which explains the low percentage of participants (3.7%) who reported receiving food or other social service support.

Similar to previous studies Crush and Tawodzera (2017); Maharaj et al. (2017) and Napier et al. (2018) prevalence of food insecurity amongst Zimbabwean immigrants in this study was notably elevated, standing at

75%. Within this group, 14% experienced mild food security, while 33% and 28% were classified as moderately and severely food insecure, respectively (Figure 3). These results are consistent with previous studies conducted amongst African immigrants in USA (Berning, Norris, & Cleary, 2023; Setiloane & Mukaz, 2020), Australia (Mansour, Liamputtong, & Arora, 2020) and Italy (Carney & Krause, 2020). The level of food insecurity amongst Zimbabweans is higher than those reported in the South African food security national studies. For example, the General Household Survey revealed that 21% of households are food insecure (Stats, 2023b).

The population of Zimbabwe immigrants in Pietermaritzburg is experiencing food insecurity due to various causes. Of the income/employment-related factors, the majority of the participants perceived loss of employment and reduced salary to contribute to their food insecurity, whereas fewer respondents considered the inability to find employment to influence food security. This could be emanating from the fact that while they can get some jobs to do, these are often menial and too erratic (Mueller et al., 2022) to fully sustain their livelihoods, including consistent food security. It has also been reported that Zimbabwean immigrants across South Africa easily find employment for semi-skilled labour or in the 'informal sector' of hairdressing, gardening, house cleaning, and hospitality industry (Manik, 2014).

The South African social and political environment is generally volatile (Marais, 2021) with the situations worse for immigrants (Crush, Tawodzera, Chikanda, Ramachandran, & Tevera, 2018). For example, recent social and political unrest has often left immigrants without access to shelter within which they can prepare meals, their seasonal and unskilled employment, businesses and stock, and their other sources of income inaccessible (Crush & Tawodzera, 2016). This therefore explains why most participants strongly agreed that theft, insecurity /violence, political crisis, and lack of land ownership contribute to food insecurity. The fact that over 75% of the respondents strongly agreed that high food prices resulted in food insecurity is indicative of the economic recession and high inflation that have affected many countries globally (Grace, Brown, & McNally, 2014; Gregory & Coleman-Jensen, 2013) including South Africa (Kassy, Ndu, Okeke, & Aniwada, 2021).

The result of the logistics regression revealed that age, immigration status, and employment type significantly affected household food security. Being older (60 years and above) was associated with food security. This was not expected and was contrary to previous studies. Generally, older people are known to be susceptible to food insecurity (Alarcão et al., 2020). However, literature has also shown that new immigrants usually experience a lot of barriers that impede on their ability to achieve food security (Ramsahoi, Sonny, & Monk, 2022). Given the reference group (25–31 years), this could suggest that these are new immigrants who are still trying to find their feet. These results are comparable to the study that was conducted amongst African immigrants in the United States, wherein it was reported that older respondents (52+ years) were less likely to be food insecure compared to those in the 18–30 age range (Setiloane & Mukaz, 2020).

The observation that immigrants that are documented were likely (p<0.081) to be food secure compared to asylum seekers and refugees was expected due to the higher chances of employment and guaranteed income to procure food supplies amongst immigrants with documented status (Karnik & Peterson, 2023).

As expected, respondents in blue-collar jobs were less likely to be food secure compared to those in semi-skilled jobs. In South Africa and most developing countries, semi-skilled jobs secure a larger and more stable income versus blue-collar jobs, which are erratic and earn a lower income. However, semi-skilled jobs such as hairdressing, working in restaurants, and gardening that employ most immigrants tend to be seasonal, with employees in this sector reported to be earning below the minimum wage. In addition to this, the current study was conducted during the COVID-19 pandemic. This job sector was significantly affected by movement restrictions that were imposed during this time, and employment rates in the whole of South Africa and globally fell drastically even post-COVID-19 as the aftermath of the COVID-19 pandemic reverberated through the labour market (Altman & Group, 2022). Previous research has shown that the COVID-19 pandemic had a significant impact on job losses, especially for immigrants.

This is attributed to the fact that most jobs that are usually occupied by immigrants do not allow remote working and were hugely affected by lockdown restrictions (Borjas & Cassidy, 2020).

It was not expected that variables such as income and education were not correlated with food security because, as discussed earlier, the majority of food in South Africa is bought, and for a population that cannot access social grants, income will be the main avenue through which immigrants can access food. In addition to this, according to literature, better education makes it possible for people to get good jobs that will earn them a good income to secure food. However, it also needs to be noted that despite the majority of the participants being highly educated and with skilled and semi-skilled jobs, the income of this population was just above the minimum wage of South Africa (Webster & Francis, 2019) but below the South African average income of Writer (2023). Such discrepancies are expected amongst economic immigrants as they are reported to be exploited and paid below market rates, which could contribute to the non-significance of income and education on household food security status in this population.

6. CONCLUSION

This research contributes to the body of knowledge. It also confirms previous findings, which indicate that food insecurity tends to be higher amongst immigrants. The study further highlights the fact that migrant incomes are often low and unstable. To the best of our knowledge, Crush and Tawodzera (2017) study is the only one that evaluated food insecurity of Zimbabweans in South Africa, and their results confirm these findings. However, their study did not examine the socio-economic characteristics that are associated with food insecurity. In this study, socio-economic factors such as the type of employment, age, and immigration status were associated with food insecurity.

6.1. Implications for Policy

The findings of this study emphasize the need for smooth and efficient immigration processes, as these improve employment prospects. Furthermore, the study recommends measures to increase the minimum wage and and improve employer compliance. This will not only benefit immigrants but also the majority of South Africans that fall in the lower income group. These results also show that there is a need for food aid programmes that are tailor-made for immigrants. Considering the age group that is mostly vulnerable to food insecurity in this study, policy considerations to extend programmes such as Expanded Work Programmes to this vulnerable group are thus recommended.

6.2. Limitations and Recommendations for Future Research

The study was cross-sectional in nature; therefore, longitudinal studies could assist in exploring and further understanding of food security issues that this immigrant population is facing. Due to the complexity and heterogeneity of the food security issues, the authors are aware that studies that are focused on segregated immigration statuses such as asylum seekers and refugees could have yielded interesting results; however, due to the paucity of data on this subject in South Africa, a baseline study to ascertain if indeed food security is a problem among Zimbabwean immigrants was necessary. Future studies on these different immigrant groups are thus recommended.

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