# **REVIEW**



# African immigrants' health behaviors related to non-communicable diseases- a qualitative systematic review

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# Abstract

**Background** Non-communicable diseases (NCDs) are on the rise globally, accounting for approximately 71% of deaths worldwide. This upward trend has also been observed among the increasing population of African immigrants residing in Western countries, where health behavior and various sociocultural and socioeconomic factors contribute to the growing prevalence of NCDs in this group.

**Aim** This study explored the health behaviors of African immigrants related to NCDs, and the sociocultural and socioeconomic factors influencing these behaviors. The aim is to provide evidence-based insight that can be used in the development of culturally sensitive interventions in the prevention of NCDs among African immigrants in Western countries.

**Method** A comprehensive search of relevant literature was done to identify relevant articles using three databases (MEDLINE, CINAHL, and SCOPUS) between 2022–2024. The systematic review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Based on the inclusion and exclusion criteria, 11 studies were included in the final synthesis.

**Results** The findings showed that African immigrants retain both positive and negative health behaviors after migration, while also adopting certain behaviors from their host countries that heighten their risk of developing NCDs. Additionally, socioeconomic status before and after migration, as well as sociocultural values, were found to have a negative influence on their health behaviors. Gender-specific factors also contributed to shaping these behaviors.

**Conclusion** Considering the changing environment African immigrants encounter in their host countries, it is essential to account for the unique characteristics of this growing group when designing culturally sensitive health interventions aimed at preventing NCDs.

Keywords African Immigrants/Migrants, Health behaviors, Non-communicable diseases

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## Introduction

Non-communicable diseases (NCDs), also referred to as chronic or lifestyle diseases, are long-lasting conditions that progress slowly and are influenced by genetic, physiological, environmental, and behavioral factors. Examples of NCDs include cardiovascular diseases, cancer, and diabetes [1, 2]. Often described as the pandemic of the twenty-first century, NCDs pose a global threat, affecting countries regardless of their economic



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development, demographic, or epidemiological stage. Each year, NCDs are responsible for the deaths of 41 million people, accounting for 71% of global mortality and contributing significantly to the worldwide disease burden [1, 3, 4]. This rising trend is also evident among African immigrants in high-income countries [5]. NCDs are commonly linked to health behaviors [6, 7] and share preventable biological risk factors, including high blood pressure, high cholesterol, and obesity. Research indicates that factors such as unhealthy diets, physical inactivity, environmental influences, and tobacco use contribute to the risk of developing NCDs [2, 8–10].

In this study, African immigrants are defined as individuals of African descent who have relocated from different regions of the African continent to Western countries, irrespective of their age, gender, duration of stay, or reason for migration. Western countries on the other hand encompass most nations within the European Union, along with the U.K., Norway, Iceland, Switzerland, the United States, Canada, Australia, and New Zealand [11]. Over the past few decades, Western countries have seen a rapid increase in African immigrant populations. For example, the number of African immigrants in the United States grew from 881,000 in 2000 to 2.1 million by 2015 [8]. Research on the "Healthy Migrant/Immigrant Effect"shows that immigrants tend to be healthier upon arrival compared to the native-born. However, their health often deteriorates over time, with immigrants eventually developing the same diseases prevalent in the host population, including NCDs [9, 10]. These studies indicate that changes in dietary habits, reduced physical activity, higher stress levels, and poor sleep patterns contribute to a rapid decline in immigrants' health [12, 13], leading to the adoption of unhealthy behaviors and a sedentary lifestyle, which increases the risk of developing NCDs.

According to Berry's bi-dimensional acculturation model, four cultural orientations describe how migrants settle into a new country: 1. Separation, where migrants maintain their original culture, 2. Assimilation, which involves giving up one's own culture to adopt the host country's culture, 3. Integration, where individuals preserve their own culture while also adopting aspects of the host culture, and 4. Marginalization, where neither the original culture nor the host culture is maintained [5, 14-16]. The relationship between acculturation, health, and NCDs among African immigrants in high-income countries has been well documented. Upon arrival, African immigrants often bring traditional food-related beliefs and practices as a way of preserving their cultural identity [17, 18]. While maintaining these cultural habits, they also tend to adopt some unhealthy behaviors from the host country, such as increased consumption of unsaturated fats, sugar, refined carbohydrates, more meat, and less fiber, fruits, vegetables, nuts, and seeds [17], Additionally, African immigrants often face challenges like cultural shock, difficult living and working conditions, changes in family dynamics, insecurity, homesickness, and low socioeconomic status, which can lead to chronic stress [19]. These factors significantly impact their health behaviors.

Health behaviors are crucial determinants of overall health. These encompass both intentional and unintentional actions, such as diet, physical activity, sleep patterns, alcohol, smoking, and substance use. This review identifies these behaviors as significant contributors to the increasing prevalence of NCDs among African immigrants [20]. Various health behaviors play a role in preventing different health issues. Consequently, there is no unified research consensus on all health behaviors. These behaviors are fluid and are strongly influenced by factors such as culture, environment, socioeconomic and sociocultural status of the individual [21]. For African immigrants, adapting to a new lifestyle poses a significant challenge, often differing from the lifestyles they are accustomed to [22]. As the number of African immigrants in high-income countries continues to rise, studies have shown that changes in health behavior are major risk factors for the development of NCDs among immigrants. Increasing evidence highlights the role of cultural beliefs in shaping African immigrants's health behaviors, particularly in areas such as nutrition, physical activity, and other health-related behaviors, which can increase the risk of NCDs [23, 24]. For example, in some cultures, a larger body size is associated with wealth, status, and social standing, influencing food choices and eating habits [22]. Additionally, physical activity for women may not be culturally acceptable in certain settings [25]. These cultural beliefs, combined with limited knowledge of NCDs and their risk factors, shape the health behaviors of African immigrants living in high-income countries.

A study on the health of African immigrants has shown that the sociocultural, economic, and political conditions in their countries of origin significantly impact their health experiences and risk of developing NCDs [26]. These factors may also predispose African immigrants to NCDs. Research indicates that migration and resettlement often have profound health, social, and psychological effects, particularly for migrants from developing countries [27]. A review by [18] highlights that cultural, economic, and social barriers contribute to the complexity of the acculturation process. For example, the high cost of healthy food often leads immigrants to purchase cheaper, unhealthy options [18, 28, 29]. Additionally, African immigrants tend to adopt more sedentary lifestyles upon arrival in high-income countries. The factors driving this shift are diverse and include socioeconomic status, gender, personal perceptions, cultural beliefs, environmental safety, climate, access to recreational facilities, and family dynamics [30–32].

This study is a qualitative systematic review aimed at identifying and synthesizing existing literature on the health behaviors of African immigrants related to NCDs and the sociocultural and socioeconomic factors that influence these behaviors. Previous research has primarily focused on specific African countries or ethnic groups, often addressing only particular health behaviors. Through this systematic review, the study seeks to answer two key research questions: What are African immigrants'experiences with health behaviors related to NCDs? How do they experience the impact of socioeconomic and sociocultural factors on their health behaviors? The findings from this review will provide insights for policymakers to consider the unique needs of African immigrants when designing healthcare policies.

#### Methods

The researchers followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines [33]. (Appendix 3). This section outlines the methods used, including the search strategy, study selection process, data extraction, quality assessment, and data analysis.

#### Search strategy

The SPIDER tool, a systematic approach for searching qualitative and mixed-method research articles, was used to develop the search strategy for this study [32]. This tool is particularly well-suited for qualitative research focused on participants'attitudes and experiences, ensuring rigor in the data search process SPIDER consists of five components: (S) Sample, (PI) Phenomenon of Interest, (D) Design, (E) Evaluation, and (R) Research type, which will be used to determine the eligibility criteria for the study selection [32]. The tool has five components which are the sample (S) includes African immigrants who have relocated to Western countries. The

phenomenon of interest (PI) focuses on studies exploring the health behaviors of African immigrants in Western countries related to NCDs and the sociocultural and socioeconomic factors influencing these behaviors. Published articles with a qualitative study design (D) are excellent in capturing participants'experiences. The evaluation (E) was based on participants'experiences with health behaviors related to NCDs and the impact of sociocultural and socioeconomic factors on these behaviors. No research type (R) was specified, as methodologies are often not mentioned in article keywords or abstracts. (See Table 1).

A comprehensive search strategy was developed in collaboration with an information specialist, utilizing various combinations of search terms and Medical Subject Headings (MeSH) for MEDLINE, CINAHL, and SCO-PUS (Appendix 1). The initial search was conducted in May 2021 and updated in October 2022 and August 2024 across all three databases. Three distinct search strings were employed to identify all relevant papers that could address the research questions. The following search terms were used with Boolean operators OR and AND + truncation"Africa""immigrant""migrant""noncommunicable diseases""chronic disease""cardiovascular disease""lifestyle disease""socioeconomic factor s""socioeconomic""sociocultural""culture""phys ical activity""Exercise""Life Style""Diet""lifestyle pattern""obesity""health behavior" "health behaviour" "attitude to health." The term lifestyle and lifestyle pattern were used as synonyms for health behaviors to maximize the search results. The same search terms were used in all three databases.

#### Study selection

A total of (n = 448) articles were identified and exported to the reference management software Endnote X9, where duplicates (n = 175) were removed. The data screening and selection process was carried out independently by two researchers (X.X and X.X). The first stage involved screening the titles and abstracts of the identified studies. Both researchers compared their findings throughout the process before making decisions on

**Table 1** Eligibility criteria according to SPIDER criteria for the data search [32]

SPIDER Tool	Search terms
S	African immigrants who have relocated and residing in Western countries
PI	Studies exploring the health behaviors of African immigrants in Western countries related NCDs
D	Publish articles with a qualitative study design
E	Studies focusing on African immigrants'experiences with health behaviors related to NCDs and the impact of sociocultural and socioeconomic factors on these behaviors formed the basis for study selection
R	No specific research type

which articles to include or exclude, based on the established inclusion and exclusion criteria.

The inclusion criteria for this review were as follows: (a) Studies focusing on individuals of African descent, including refugees and asylum seekers, who have migrated from Africa and are residing in Western countries, (b) qualitative study designs. This review specifically targeted qualitative studies, as the goal is to synthesize participants'experiences, which are difficult to quantify in this context. Additionally, (c) studies reporting on one or more of the following: health behaviors, and lifestyle patterns of African immigrants, socioeconomic and sociocultural aspects influencing health behaviors, and NCDs, (d) Only Original, scientific and peer-reviewed articles were included, (e) the studies had to be written and published in English with available abstracts and published between 2013 and 2024.

Conversely, articles were excluded if they (a) focused on African immigrants born in a Western country or residing in non-Western countries, (b) quantitative study design, (c) studies reporting on other things besides Health behaviors, and lifestyle patterns of African immigrants, socioeconomic and sociocultural aspects influencing health behaviors and NCDs, (d) All review articles, conference papers, textbooks and reports, (e) studies written in languages other than English and published before 2013.

All inconsistencies during the selection process were resolved through discussions among the researchers, achieving a relatively high agreement rate for each stage. The same inclusion and exclusion criteria were consistently applied throughout the entire data screening and selection process. Systematic reviews typically exclude up to 90% of studies, such as those meeting one or more exclusion criteria or those with incomplete methodologies [34]. In total, 23 articles were selected for full-text examination, leading to the inclusion of 11 articles in the final synthesis. (See Fig. 1).



Fig.1 PRISMA flow diagram of article search and study selection process indicating the number of included studies in the systematic review on African immigrants' health behaviors related to NCDs, and the socioeconomic and sociocultural influencing health behaviors [33]

#### Data Extraction and quality assessment

Data from the included studies were extracted using a form that was piloted by two other researchers, X.X and X.X (Table 2). This form captured the following information: the first author's name, publication year, study purpose, host country, participants' country of origin, study design, sampling instrument, sample size, findings relevant to the review, and quality assessment scores. All studies included in the synthesis were evaluated using the JBI Critical Appraisal Checklist for qualitative researchers (X.X and X.X). This tool allows researchers to determine the level of evidence for each study included in the synthesis, thereby assessing the validity and reliability of the study's findings.

The tool has 10 questions, assessing 1) the congruity of the philosophical perspective of the research methodology, 2) the congruity between the research method and the research question, 3) the congruity between the methodology and data collection method, 4) the congruity between research methodology 5) the congruity in the representation of analysis and interpretation of results, 6) a statement locating the research culturally or theoretically, 7) the influence of the researcher on the research, 8) the voices of the participants represented in the report, 9) ethical approval of the study, and 10) conclusions drawn in the research report flow from the analysis or interpretation of the data [35].

Each study was rated as "Yes = Y," "No = N," "Unclear = UN," or "Not applicable = NA" based on responses to the ten questions. A score of 1 was given to the Yes answers and the other answers were assigned a score of Zero [35]. The total score for each article was the sum of all the "Yes" answers. (see appendix 2), which were included in the data extraction form. (see Table 2) Previous systematic reviews which have used the JBL tool have classified studies with scores above 70% as high quality, those scoring between 50 and 70% as medium quality, and those scoring below 50% as low quality. In this study, four studies had a total score of 8 points (80%), three studies scored 7 points (70%), and four studies scored 6 points (60%) [36] Although no threshold scores were established for inclusion and no studies were excluded based on their quality scores, it is worth noting that 4 out of 11 articles were classified as high quality, while the remaining 7 were rated as moderate quality.

#### Data analysis

A conventional inductive content analysis approach was employed in the data analysis process, whereby the coding categories emerged directly from the data [37].

Selected articles were imported into the Atlas.ti software program to facilitate data coding. The analysis involved familiarizing with the data, coding, and identifying both subcategories and main categories in relation to the research questions. Three of the eleven articles were piloted by all three researchers, during which the codes were compared, discussed, and agreed upon. One researcher subsequently coded the remaining eight articles, which were then reviewed by the other two researchers. A total of 86 codes were derived from the selected articles. One researcher interpreted the results with input from the other two researchers.

#### Findings

The selected studies were published between 2011 and 2022, originating from the United States (n = 6), Australia (n = 2), Canada (n = 1), the Netherlands (n = 1), and Sweden (n = 1), and consisted solely of peer-reviewed articles. All the studies employed a qualitative approach, utilizing focus group interviews (n = 4), individual interviews (n = 3), storytelling (n = 1), and photography accompanied by interviews (n = 3). The eleven studies collectively involved a total of 300 participants (Appendix 2).

The findings of this study primarily highlight the experiences of African immigrants regarding health behaviors related to NCDs and the sociocultural and socioeconomic factors that shape these behaviors.

#### Health behaviors related to NCDs

According to the analysis, health behaviors were categorized into two main groups: positive and negative health behaviors.

#### Positive health behaviors

Several studies highlighted the positive health behaviors adopted by African immigrants from their host countries, particularly in relation to diet and nutrition. These behaviors included controlling portion sizes and modifying cooking methods. For instance, one participant shared"I cut the plantains and I cook it with the beans so, I don't have to fry these."[38] Participants also reported eliminating unhealthy food choices from their diets, such as fast food, soda, chips, and other snacks One noted [38–41],"I've learned to completely stay away from oil.....I have learned to take off the skin of the chicken before eating it to avoid the fat.....I eat more fish than I used to" Other improvements in eating habits included adjusting meal timing, with one participant saying [38],"We don't eat solid food at night." [39]. Additionally, regular consumption of vitamins, herbs, African spices, and healthy drinks like smoothies and

Table 2 Characteris	stics of the selected studies	and Quality as	sessment (n = 11)					
Author, year	Purpose of study	Host country	Participant´s country of origin	Study design	Sampling instrument	Sampling size	Study Findings relevant to the research	Quality Assessment (1–10)
Addo et al., 2019	To explore socio-cultural beliefs about an ideal body size among Australian residents who were born in Sub-Saharan Africa	Australia	Sub Saharan Africa	Qualitative	Interview	24	A moderately large body size is idealized in sub- Saharan Africa communi- ties. Post-migration weight gain is regarded as evi- dence of well-being. Body ideals are different for men and women, ideals pro- moted by family and friends	8 High quality
Adekeye et al., 2014	To understand health literacy levels, and health concerns from the per- spective of older African immigrants, to empower the African immigrant community to express their opinions and to inform and influence key commu- nity stakeholders of issues identified by the African immigrant community	United States	African immigrants	Qualitative	Photography with focus group interview	<u>7</u>	Nutrition, obesity and physi- cal activity, occupational regulation and educational opportunities, feeling of security and public safety, ethno-racial diversity and the health care system, and religiosity and social well-being	8 High quality
Alemu et al, 2021	To explore the behavioral, normative and control beliefs of physical activity among first-generation Ethiopian immigrants living in the DC-Metro area	United States	Ethiopia	Qualitative	Focused group interviews,observations	<u>.</u>	Increased longevity, mental well-being, improved sleep and improved metabolism were listed as the common benefits of physical activity. Lack of time, family respon- sibility, neighbourhood safety, location of the gym, lack of awareness and social and economic stressors were the major barriers to engage in physical activity	8 High quality
Babatunde-Sowole et al, 2018	Describe women's experi- ences of weight gain and obesity as they became acculturate to the Austral- ian diet and lifestyle	Australia	West African coun- tries	Qualitative	Storytelling using open ended questions	Ξ	Obesity has long -term consequences for health and wellbeing	7 Moderate quality
Brathwaite & Lem- onde, 2015	To explore health beliefs held by adult African immigrants regarding dia- betes and their practices in preventing it	Canada	African immigrants	Qualitative	Focus group interview	14	Health beliefs and cultural practices influenced behav- iour in preventing type 2 diabetes	8 High quality

Table 2 (continuec								
Author, year	Purpose of study	Host country	Participant´s country of origin	Study design	Sampling instrument	Sampling size	Study Findings relevant to the research	Quality Assessment (1–10)
lbe-Lamberts et al., 2018	To explore the cultural perception of transna- tional African immigrants on physical activity and to investigate the vari- ous factors that influence attitudes and beliefs of transnational African immigrants towards physi- cal activity based on their multinational connection	United States	Nigeria	Qualitative	Interview with photo- elicitation	24	Participants identified factors such as cultural differences, lack of educa- tion, and transnational responsibilities as influential to their choices for physical activity	6 Moderate quality
Janzon & Bolmsjö, 2013	To examine post migra- tion dietary changes, and knowledge about risks for heart diseases among Somali women, To examine the women's perceptions of body image, self-esteem, and their knowledge about the posi- tive effect of physical activity	Sweden	Somali		Interview	œ	Somali migrated women in Sweden had changed their diet and experienced weight increase. They reported low self-esteem and little motivation for physical activity. Participants igeneral knowledge about the rela- tion between obesity and inactivity enhanced risk for heart diseases and had preference for a larger female body image. Participants also expressed low self-esteem, loneliness and alienation from society	7 Moderate quality
Kaplan et al., 2013	To understand the per- ception of Ghanaians immigrants of the health status and heath trajectory of their community	United States	Ghana	Qualitative	Focus group interview	63	Changes in health behaviors, increased stress, environmental exposures, and barriers to health care	6 Moderate quality
Nicolaou et al, 2012	To gain insight into the influences on Moroccan migrant women's weight and weight related behav- iour by enriching their perspectives with those of their non-migrant com- patriots living in Morocco	Netherlands	Morocco	Qualitative	Focus group	53	Lack of knowledge regard- ing appropriate physical activity. Low levels of physi- cal activity attributed to changes in lifestyle due to migration, with problems adjusting to these changes. A cultural shift in preference towards slimmer body sizes was also reported	6 Moderate quality

Author, year	Purpose of study	Host country	Participant´s country of origin	Study design	Sampling instrument	Sampling size	Study Findings relevant to the research	Quality Assessment (1–10)
Simonsen et al., 2015	To learn about the underly- ing social, cultural and gen- der issues that contribute to the increased obesity risk among Utah women and to inform intervention development	United States	Burundi, Rwanda, African Americans, African Indians, Hispanics and pacific Islanders	Qualitative	Focus group interviews	99	Health is multidimen- sional, a lack of resources and time influence physical activity behav- iours and food choices, the norms about healthy weight vary across cultural groups, women and men have important but dif- ferent influences on diet and physical activity prac- tices within the house hole, women hold an influential role in the health of families and children, and oppor- tunities exist within each of the communities to improve weight related health	6 Moderate quality
Turk et al, 2014	To explore the percep- tions and practices of Nigerian immigrants regarding healthy eating and physical activity in the United States, to assess the influ- ence of cutural beliefs of Nigerian immigrants on eating and physical activity, to describe the role that healthcare provid- ers can play to promote healthy eating activity and to evaluate the feasibility of Nigerian immigrants regard- ing healthy eating and physical activity	United States	Nigeria	Qualitative	Photography with focus group discussions	ε	Moderation is healthy, Nigerian ways of living are healthy, acquiring American ways is unhealthy, and cul- tural context is important to promote healthy behaviors	7 Moderate quality

herbal tea were positive habits maintained by participants in these studies. Other health behaviors adopted from the host country included using less oil in cooking, increasing fruit and vegetable intake, reducing carbohydrate consumption, cutting back on fast foods and sugary drinks, and incorporating physical activity into daily routines [39–41].

Participants in two studies engaged in various physical activities, including walking, running, and football [39, 42]. Others, unable to go to the gym, found alternative ways to stay active, such as parking farther away from shopping malls. As one participant shared,"If I go to the mall, I don't park close to the store. I like parking far away to get exercise."[38] The frequency of physical activity varied, ranging from once a week to several times a week, with sessions lasting anywhere from 30 min to 2 h, depending on the activity. The motivations for exercising were diverse, including enjoyment, social interaction, improving metabolism, and stress relief,"when exercise, you release stress...you feel more confident and good about yourself." [42]

#### Negative health behaviors

Several studies also highlighted negative health behaviors related to food, nutrition, physical activity, and sleep patterns. Participants in these studies reported consuming diets high in starch and sugar. As one participant mentioned."We use fat, starch, and sugars in the wrong proportions....I put 3 teaspoons of sugar in my cup of tea." [41] Some participants struggled with portion control, which was a cultural practice they maintained. They tended to eat large portions of food but less frequently than the meal frequency recommended in their host country [38, 41]."I don't care much about what I eat and how much. I eat big portions twice a day."[41]

Some of the selected studies also identified negative health behaviors such as the consumption of fried fast food and pre-packaged meals, as well as irregular mealtimes and late-night eating due to busy schedules and a lack of time to prepare proper homemade meals [43-45]. One participant noted, "European Moroccans consume large amounts of fried fast food." [45] In addition, one study found that participants did not meet the recommended daily servings of fruits and vegetables [40]. Lack of sleep was another factor contributing to poor health, with sleep deprivation being linked to an increased risk of developing non-communicable diseases (NCDs). Participants in one study mentioned sleep deprivation as a cause of negative health outcomes, with one stating, "Here, no one gets enough sleep." [44] Furthermore, despite the importance of water for health,

one participant highlighted the low water consumption among African immigrants. "I know some women who don't even drink water. All they do all day long is to drink coffee and milk and sugar." [41]

#### Sociocultural factors influencing health behaviors

According to the analysis, the sociocultural factors influencing health behaviors include perceptions and influences of body size, food practices and accessibility, perceptions of physical activity, environmental factors and safety, as well as cultural norms and gender roles.

#### Perceptions and influences of body size

Several studies highlighted the strong cultural influence on body size, which significantly shapes participants'health behaviors [40, 41, 43, 45, 46]. In many African cultures, weight gain is associated with good health, beauty, wealth, high socioeconomic status, security, happiness, and a successful marriage. Gaining weight after marriage is seen as"a source of pride to the woman indicating the capacity of the husband to provide for her."[43] In these cultures, larger body size is often admired and linked to positive traits such as prosperity and happiness [45]. This cultural belief helps explain why some participants in one study expressed an increased desire for food and a deliberate effort to gain weight [46]. One participant noted,"An African woman that is obese or overweight represented a woman who has been provided with a good life and marriage." while "Men with waist/belly fats are regarded as financially rich." [46]

Body image also plays a key role in women's ability to find a partner, with physical appearance and societal opinions influencing behavior [41, 45]."In order to look good, women may be inclined to maintain a certain level of overweight." [45] Conversely, slimness is often associated with an unsuccessful marriage, illness, or low socioeconomic status [41]. "I was brought up to appreciate beauty in terms of roundness, meaning a woman must be fleshy" Women with slim body sizes were classified as ill." [41, 46]

### Food practices and accessibility

Several studies also revealed cultural influences on food practices among African immigrants [38, 39, 43–46]. Participants primarily consumed traditional cuisine but also incorporated foods from their host countries. Food choices were influenced by taste preferences, lack of time to cook proper meals, the availability of unhealthy food options, and the nutritional value of foods adopted from the host country. Traditional African dishes are often prepared with specific ingredients and oils to maintain their authentic flavor. As one participant explained about a traditional vegetable stew,"You have to use a little bit of palm oil for taste. If you take out all the fat, what else do you have for taste?" [38] In African culture, many immigrants feel a strong responsibility to provide for both their immediate and extended families back home. This obligation often leads to long working hours, leaving little time for preparing traditional African meals, which are typically time-consuming. The lack of time to prepare healthy homemade meals led many participants to consume fast food and soft drinks, which are affordable and easily accessible. One participant noted,"There are small shops everywhere and getting junk food is easy"...."The hectic Australian lifestyle caused them to embrace readily available fast foods and packaged meals."[43]

#### Perceptions of physical activity

In one study on cultural beliefs about physical activity, participants viewed certain activities, like yoga, as being linked to spirituality, which conflicted with their personal spiritual beliefs and cultural values [47]. In another study, physical activity was primarily associated with weight loss, leading participants to discontinue exercising once they had reached their desired weight [40]. Additionally, there was a belief in some cultures that physical activity is not meant for women, except for the purpose of losing weight [45]. Participants in another study also expressed the idea that physical activities were intended for specific groups, with one participant stating, "Cycling was viewed as being very Dutch." [45]

#### Environmental factors and safety

The changing environment and safety were also identified in some studies as factors influencing health behaviors. Participants in several studies highlighted unsafe neighborhoods as barriers to engaging in physical activity [40, 48]. Additionally, cold weather was noted as a significant obstacle, especially due to the stark contrast between the colder climates in Western countries and the warmer temperatures in African countries, which discouraged some from participating in outdoor physical activities [40, 48].

#### Cultural norms and gender roles

One article highlighted the influence of cultural norms on women's health. It noted that women were discouraged from discussing marital conflicts with others, as these issues were considered private matters. This cultural expectation puts women at risk of developing stress and depression, potentially leading to social isolation [44]. Additionally, language barriers, particularly during hospital visits, often prevented participants from understanding health guidance or effectively communicating their health concerns to healthcare providers. The situation was further complicated by the lack of cultural competence among healthcare providers, which exacerbated these challenges [44].

#### Socioeconomic factors influencing health behaviors

The socioeconomic factors influencing health behaviors, as identified in the analysis, include socioeconomic status before migration, unemployment and income levels, the cost of food, family pressure, and the support of extended family members.

#### Socioeconomic status premigration

Several studies have examined how pre-migration standard of living can lead to post-migration weight gain. One of the main reasons many Africans migrate to Western countries is to seek a better life, as many live below the poverty line in their home countries. Once in the West, their economic situation improves, often leading to unhealthy changes in their health behaviors [41, 44, 45]. Consuming Western foods such as pizza, fries, burgers, and sodas is a sign of the good life. As one participant noted, "back home eating fast food is for the affluent...but here it's cheaper than other foods.....at home soda was a special treat consumed only on Christmas or on your birthdays." [44] Postmigration weight gain is also perceived as a sign of wealth, as migrants can now afford to indulge in what was once inaccessible. One participant shared"I did not have the opportunity to eat chicken...seeing chicken in Sweden drove me mad .....when I went shopping with my husband and I saw the chicken, I ordered 4-5 pieces for one meal.....I ate a lot of ice cream as well as chocolate." [41] Additionally, weight gain after migration is attributed to the easier lifestyle adopted in Western countries, where many have cars and household chores are automated, leading to reduced physical activity [43, 45]. As one participant observed,"The women in Holland do not walk, they have a car, and they do not have much work in the house. They have wash machines." [45]

#### Cost of healthy food

Participants in several studies highlighted that financial constraints, due to unemployment and the high cost of healthy food options, made it difficult for them to afford nutritious foods such as vegetables, fruits, and whole grains, which were often more expensive than fast foods [40, 48]. One participant noted, "Women may not buy fruits and vegetables...not because they don't think they

are healthy, but because they do not have the money to purchase them."[40] Similarly, the lack of money to pay for recreational activities like gym memberships was a barrier to engaging in physical activity. As one participant explained [40, 42]. A participant stated,"I don't have extra money to pay for a gym".....if I get a job that pays me more and if I have leisure time, I would engage in physical activity." [42]

#### Extended family support

Despite moving to Western countries where economic conditions are generally better, African immigrants often face significant financial obligations to their families back home. Several studies highlight that extended family support places a financial burden on these immigrants, requiring them to work continuously, often without holidays, to meet these demands [47]. Participants expressed a strong sense of duty and responsibility to provide for family members in their country of origin. This financial pressure leaves many working multiple jobs, leaving little time for physical activity [43, 47, 48]. As a result, the focus shifts from maintaining a healthy lifestyle to fulfilling these financial responsibilities. As one study noted," The desire to attain enough wealth to take care of the family on a local and transnational level supersedes any other goal."[47]

#### Discussion

This study aimed to identify and synthesize existing knowledge about African immigrants'health behaviors related to non-communicable diseases (NCDs) and the sociocultural and socioeconomic factors influencing these behaviors. Eleven studies met the inclusion criteria and were included in the systematic review [35–45]. The findings revealed that while African immigrants have retained both positive and negative health behaviors after migration, they have also adopted certain practices from their host countries. Additionally, socioeconomic and sociocultural factors have been found to negatively impact the health behaviors of African immigrants.

Consistent with findings from other studies, the experience of migration to Western countries introduces various environmental, economic, and cultural changes that significantly influence health behaviors. Participants in some of the selected articles reported both positive and negative health behaviors among African immigrants related to non-communicable diseases (NCDs). This aligns with Berry's bi-dimensional acculturation model, particularly the integration orientation, where immigrants maintain certain aspects of their own culture while also adopting elements of the host culture. The socioeconomic situation prior to migration has a considerable impact on health behaviors post-migration, which is supported by previous research [18, 26]. For instance, foods that were once affordable only to high-income families in their home countries-such as fast food, mayonnaise, salad dressing, chicken, margarine, and ice cream-are now readily available and affordable to African immigrants. The findings indicate that feelings of deprivation regarding these foods can lead to increased consumption levels [41, 49]. Moreover, the socioeconomic environment plays a crucial role in determining food choices made by African immigrants. The high cost of healthy food options, combined with a lack of time to prepare nutritious meals, often leads many to prefer fast food, which is seen as cheaper.

The review included immigrants of African descent who have migrated from various regions of the African continent, regardless of age, gender, and duration of stay. Additionally, the reasons for migration, which may include economic, refugees, and family reunions, were not considered as a criterion. However, research has shown that the reason for migration influences migrants'experiences during the migration process and can significantly impact their overall health. For example, a study by [50, 51] found that individuals migrating as refugees may be more vulnerable to chronic health conditions, such as post-traumatic stress disorder (PTSD), due to traumatic experiences during transit and unsafe travel conditions. These factors can increase the risk of developing NCDs or exacerbate pre-existing conditions [50, 51]. It is essential to consider these various migration reasons to determine the type, urgency, and intensity of any intervention required to prevent the onset of any NCD or exacerbate an existing health issue.

Physical activity is a crucial health-promoting behavior that can enhance overall well-being and help prevent NCDs. Although participants in some studies reported engaging in various forms of physical activity, their motivation is significantly influenced by several factors, including knowledge of the health benefits, family support, gender roles, available time, safety concerns, distance to activity locations, economic conditions, and cultural beliefs [39, 42]. Financial obligations and the pressure to support extended families serve as barriers to maintaining an active lifestyle. Due to this pressure, some immigrants are juggling multiple jobs, leaving little to no time for recreational activities. Additionally, some participants expressed that they could not afford gym memberships. A study conducted on Hispanic immigrants in the United States found that these individuals tended to be more active and physically fit before migration, as physical activity was a regular part of daily life in their home countries. Other obstacles to maintaining an active lifestyle include safety issues and adverse weather conditions [22].

Cultural factors that associate body size, shape, and stomach size with definitions of beauty, wealth, and happiness act as barriers to achieving and maintaining a healthy weight among African immigrants. These findings align with a study on Sub-Saharan Africans, which indicated that thinness is often considered undesirable and viewed as a sign of poverty [22]. Such cultural beliefs and perceptions can significantly influence dietary habits, physical activity, and other health-promoting behaviors, ultimately increasing the risk of developing non-communicable diseases (NCDs) among African immigrants [41, 43].

The findings of this study provide an intriguing perspective on how gender roles and gender differences shape the health behaviors of African immigrants. Emphasizing the idea that knowledge is power, health literacy regarding non-communicable diseases (NCDs) emerges as a critical factor influencing lifestyle patterns and health behaviors. However, very few participants in the selected studies demonstrated adequate knowledge about NCDs and their prevention. The community plays a vital role in fostering a sense of belonging among African immigrants, which can have a positive impact on mental well-being. Additionally, the study highlights that practices such as meditation and prayer serve as sources of comfort and are linked to improved mental health. A healthy spiritual life is closely associated with overall well-being [38, 48].

The rising prevalence of NCDs among immigrants including those of African descent is associated with various factors, including social and environmental influences, lifestyle changes in the host country, and unhealthy behaviors such as poor diet, physical inactivity, tobacco and alcohol use. Additional factors include social exclusion, illiteracy, and, in some cases, limited access to healthcare [12, 13]. The findings of this study can inform public health strategies on the importance of developing culturally sensitive and tailored health intervention strategies in the prevention of NCDs, which will alleviate the disease burden on African immigrants and the healthcare systems of host countries.

#### Strengths and limitations

The strength of this review lies in its broad scope, encompassing studies involving immigrants of African descent from the entire African continent. The use of the PRISMA flowchart throughout the literature review process enhanced the study's overall quality. All included studies met the established inclusion criteria and were peer-reviewed, strengthening the evidence presented. A comprehensive search strategy was designed and implemented in collaboration with an information specialist from the University of Helsinki. A review protocol was developed and agreed upon by all three authors and key sections of the review, including data selection, data extraction, quality assessment, and data analysis, were reviewed by at least two authors to ensure accuracy. Additionally, based on scoring criteria from previous literature reviews that employed the JBI quality assessment tool, all studies included in this review were of high or moderate quality.

The review focused on qualitative studies to gain a deeper understanding of participants' thoughts and experiences. However, limiting the review to qualitative research may have excluded other relevant studies. Additionally, restricting the review to English-language publications may have led to the omission of important information, particularly given that French is an official language in many African countries and may have been used in some relevant studies. Grey literature was not included in the review, which could have provided valuable insights to enhance the comprehensiveness of the findings. Moreover, the analysis considered African immigrants to Western countries as a homogeneous group, potentially overlooking the significant ethnic and cultural diversity among different groups from the African continent.

#### Implications for practice and research

This review revealed that gender-specific challenges influence African immigrants'health behaviors. The review also showed the vital role that mothers could play in promoting the family's health. In the African context, the mother has a crucial role in the family and is the center that binds the family together [52]. Their influence is essential in translating health knowledge into actionable practices to combat non-communicable diseases (NCDs) within the family unit. Thus, adopting a familycentered approach to health promotion, with mothers at the forefront, could benefit the entire family while being cost-effective for the state. However, certain health behaviors, such as sleep patterns, were not specifically addressed in the selected articles. Additionally, there was insufficient emphasis on stress and mental well-being. This review suggests that further research is needed to explore the specific factors influencing the health behaviors of African immigrant mothers and to assess the healthcare needs of their families. Given the rapid increase in the African immigrant population in Western countries, healthcare professionals should develop culturally sensitive health-promoting intervention packages tailored to meet the unique needs of African immigrant families. It is crucial for healthcare providers to understand the sociocultural and socioeconomic factors affecting African immigrants'health behaviors to offer realistic guidance on nutrition, physical activity, and other healthrelated practices [38].

# Conclusion

The review examined the existing literature on the health behaviors of African immigrants related to

# non-communicable diseases (NCDs) and the socioeconomic and sociocultural factors that influence these behaviors. The findings reveal a mix of both positive and negative health behaviors adopted by African immigrants from their host country, alongside certain health behaviors that have been preserved from their native cultures. Additionally, socioeconomic and sociocultural factors have significantly impacted the health behaviors of African immigrants. Consistent with the healthy migrant effect, this population is at an increased risk of developing NCDs. Therefore, it is essential to implement culturally sensitive intervention strategies when designing health promotion programs for this demographic.

#### Appendix

See Tables (Table 3, Table 4 and Table 5).

Table 3	CINAHL	search-	Ovid	interface
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S	MeSH Terms	Output
S1	africa* N2 (immigrant* OR migrant*)	777
S2	"Noncommunicable Disease*"OR"Chronic Disease*"OR"Cardiovascular Disease*"OR"non-communicable Disease*"OR"Lifestyle Disease"	199,825
S3	(MH"Chronic Disease +")	71,706
S4	(MH"Cardiovascular Diseases +")	660,999
S5	S2 OR S3 OR S4	765,251
S6	("life style*"OR lifestyle OR"lifestyle pattern*") OR ("health behavior"OR"health behaviour") OR ("attitude to health"OR"health attitude")	178,648
S7	(MH"Life Style +")	264,287
S8	(MH"Attitude to Health +")	176,211
S9	S6 OR S7 OR S8	406,495
S10	(sociocultural* OR"culture*"OR acculturation) OR"cultural characteristic*"OR (superstition* OR taboo)	52,819
S11	(MH"Socioeconomic Factors +")	391,647
S12	(socioeconomic* OR"socio economic*") OR poverty	163,293
S13	S11 OR S12	421,716
S14	("physical activit*"OR exercise*)	271,938
S15	S1 AND S9 AND S10	31
S16	S1 AND S9 AND S14	16
S17	S1 AND S9 AND S13	44
S18	S1 AND S5 AND S9	19

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Checklist for Quality Research, Joanna Briggs Institute	Addo et al. 2019	Adekeye et al. 2014	Alemu et al.2021	Babatunde- Sowole et al. 2018	Brathwaite & Lemonde, 2015	lbe- Lamberts et al 2018	Janzon & Bolmsjö, 2013	Kaplan et al. 2013	Nicolaou et al. 2012	Simonsen et al 2015	Turk et al 2014
<ol> <li>Is there congruity between the stated philosoph- ical perspective and the research methodology?</li> </ol>	NN	AN	~	z	~	NA	NA	N	NN	NN	N
2. Is there congruity between the research method- ology and the research question or objectives?	≻	~	~	~	~	~	~	~	~	~	~
3. Is there congruity between the research method- ology and the methods used to collect data?	≻	~	~	~	~	~	~	≻	≻	~	~
4. Is there congruity between the research method- ology and the representation and analysis of data?	≻	~	~	~	~	~	~	~	≻	` ≻	~
5. Is there congruity between the research method- ology and the interpretation of results?	≻	~	~	~	~	~	~	~	≻	` ≻	~
<ul><li>6. Is there a statement locating the researcher culturally or theoretically?</li></ul>	≻	~	~	UN	Z	NN	NN	N	N	N	N
7. Is the influence of the researcher on the research, and vice-versa, addressed?	z	z	Z	Z	Z	z	Z	Z	z	z	7
<ol> <li>Are participants, and their voices, adequately represented?</li> </ol>	≻	~	~	~	~	~	~	~	≻	` ≻	~
9. Is the research ethical according to current criteria or, for recent studies, and is there evidence of ethical approval by an appropriate body?	~	z	Z	~	~	Z	~	NN	Z	N	~
<ol> <li>Do the conclusions drawn in the research report flow from the analysis, or interpretation, of the data?</li> </ol>	~	~	~	~	~	~	~	~	~	~	~

Abbreviations: N = no; NA = not applicable; UN = unclear; Y = yes

Section and Topic	ltem #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review	1
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist	2
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge	3–5
Objectives METHODS	4	Provide an explicit statement of the objective(s) or question(s) the review addresses	5
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses	7–8
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted	N/A
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used	6–7
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process	7–8
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process	N/A
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g., for all measures, time points, analyses), and if not, the methods used to decide which results to collect	N/A
	10b	List and define all other variables for which data were sought (e.g., participant and interven- tion characteristics, funding sources). Describe any assumptions made about any missing or unclear information	N/A
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process	N/A
Effect measures	12	Specify for each outcome the effect measure(s) (e.g., risk ratio, mean difference) used in the synthesis or presentation of results	N/A
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g., tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5))	7–8
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions	N/A
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses	9–11
	13 d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used	13–14
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g., subgroup analysis, meta-regression)	N/A
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results	N/A
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (aris- ing from reporting biases)	N/A
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome	Appendix 2
RESULTS			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram	9

# Table 5 PRISMA 2020 checklist for reporting systematic reviews [33]

#### Table 5 (continued)

Section and Topic	ltem #	Checklist item	Location where item is reported
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded	N/A
Study characteristics	17	Cite each included study and present its characteristics	10-12
Risk of bias in studies	18	Present assessments of risk of bias for each included study	N/A
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g., confidence/credible interval), ideally using structured tables or plots	N/A
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contribut- ing studies	N/A
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g., confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect	N/A
	20c	Present results of all investigations of possible causes of heterogeneity among study results	15–22
	20 d	Present results of all sensitivity analyses conducted to assess the robustness of the synthe- sized results	N/A
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed	N/A
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed	N/A
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence	20–22
	23b	Discuss any limitations of the evidence included in the review	22
	23c	Discuss any limitations of the review processes used	22
	23 d	Discuss implications of the results for practice, policy, and future research	23
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered	not registered
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not pre- pared	Not prepared
	24c	Describe and explain any amendments to information provided at registration or in the protocol	no protocol made
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review	no funding
Competing interests	26	Declare any competing interests of review authors	no interest
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review	none

#### Abbreviations

NCDs Non-communicable diseases

WHO World Health Organisation

 SPIDER
 Sample, Phenomenon of Interest, Design, Evaluation, Research type.

 PTSD
 Post-traumatic stress disorder

#### Author contributions

ET conducted the literature search and screened the identified studies alongside TV. ET, TV, and RL critically appraised the final articles and coded selected studies using Atlas.ti. The manuscript was drafted by ET, with valuable input and revisions provided by TV and RL. All authors have read and approved the final version for submission and have agreed on the order of authorship.

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#### Data availability

No datasets were generated or analysed during the current study.

#### Declarations

#### Ethics approval and consent to participate

This study is a systematic review. According to the Finnish Research Ethics Committee principles, ethical approval is not required [53]. We declare that this manuscript has not been published before and is not currently being considered for publication elsewhere.

#### **Competing interests**

The authors declare no competing interests.

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#### References

- -World Health Organisation (WHO). Global health estimates 2019: deaths by cause, age, sex, by country and by region, 2000–2019. [Online].; 2020 [cited 22 05 10. Available from: https://www.who.int/data/global-healthestimates.
- -World Health Organisation (WHO). Key facts on noncommunicable diseases. [Online].; 2021 [cited 2022 8 22. Available from: www.who.int/ news-room/fact-sheets/detail/noncommunicable-diseases.
- -Murray CJ, Vos T, Lozano R, Flaxman AD, Michaud et al. C. Disabilityadjusted life years (DALYs) for 291 diseases and injuries in 21 regions, 1990–2010: a systematic analysis for the global burden of disease study (2012). Lancet. https://doi.org/10.1016/S0140-6736(12)61689-4; 380(9859): 2197–223.
- -Wagner KH, Brath HA. A global view on the development of non communicable diseases (2012). ;: 38–41. https://doi.org/10.1016/j.ypmed. 2011.11.012.
- -Griffith M, Mellor D, Green J, Ranzaho AMN. Migration-related influences on obesity among sub-Saharan African mi-grant adolescents in Melbourne, Australia (2014). Nutrition and Dietatics. https://doi.org/10.1111/ 1747-0080.12135 71(4): 252–257.
- -Chakma JK, Gupta S. Lifestyle and Non-Communicable Diseases: A double edged sword for future India (2014). Indian J Community Health. www.iapsmupuk.org/journal/index.php/IJCH/article/view/434 Vol. 26(4): 325–32.
- -Uddin R, Lee EY, Khan SR, Tremblay MS, Khan et al. A. Clustering of lifestyle risk factors for non-communicable diseases in 304,779 adolescents from 89 countries: A global perspective (2020). Elsevier. https://doi.org/ 10.1016/j.ypmed.2019.105955 131.
- -Anderson M. Pew Research Center. [Online].; 2017 [cited 2022 11 10. Available from: www.pewresearch.org/fact-tank/2017/02/14/africanimmigrant-population-in-u-s-steadily-climbs/.
- -Nolan A. The 'healthy immigrant' effect: initial evidence for Ireland (2012). Health Econ Policy Law. https://doi.org/10.1017/S174413311 000040X 7(3): 343–62.
- -Newbold KB. Chronic Conditions and the Healthy Immigrant Effect: Evidence from Canadian Immigrants (2006). Journal of Ethnic and Migration Studies. https://doi.org/10.1080/13691830600704149 32(5): 765–784.
- -World Population Review. [Online].; 2024 [cited 2025 January 25. Available from: https://worldpopulationreview.com/country-rankings/weste rn-countries.
- Kennedy S, Kidd MP, McDonald JT, Biddle N. The Healthy Immigrant Effect: Patterns and Evidence from Four Countries. Journal of International Migration and Integration. 2015;16:317–32.
- Lauderdale DS, Rathouz PJ. Body mass index in a US national sample of Asian Americans: Effects of nativity, years since immigration and socioeconomic status. International Journal of Obesity. 2000;24(9):1188–94.
- Sofolahan-Oladeinde Y, Iwelunmor J, Tshiswaka DI, Conserve DF. Acculturation and its influence on the health perceptions, health behaviors, and health outcomes of African immigrants in the United States: a review of the literature. Journal of Race and Policy. 2014;10(1):89–103.
- Rissel C. The development and application of a scale of acculturation. Australian and New Zealand journal of public health. 1997;21(6):606–13.
- Berry JW. Immigration, Acculturation, and Adaptation. Applied psychology. 1997;46(1):5–34.
- 17. Bhugra D. Migration, distress and cultural identity. British medical bulletin. 2004;69(1):129–41.
- Popovic-Lipovac A, Strasser B. A review on changes in food habits among immigrant women and implications for health. J Immigr Minor Health. 2015;17:582–90.
- Pudaric S, Sundquist J, Johansson SE. Major risk factors for cardiovascular disease in elderly migrants in Sweden. Ethnicity & Health. 2000;5(2):137–50.
- Mark C, Paul N. Health behaviour: Current issues and challenges. Psychol Health. 2017;32:895–906.
- Short SE, Mollborn S. Social Determinants and Health Behaviors: Conceptual Frames and Empirical Advances. Current Opinion in Psychology. 2015;5:78–84.
- Renzaho AM. Fat, rich and beautiful: changing socio-cultural paradigms associated with obesity risk, nutritional status and refugee children from sub-Saharan Africa. Health & Place. 2004;10(1):105–13.

- Airhihenbuwa C, Iwelunmor J. Why culture matters in reducing the burden of NCDs and CDs in Africa. Commonwealth Health Partnerships. 2012;2012:107–11.
- Rodrigues G, Jongbloed L, Li Z, Dean E. Ischaemic Heart Disease–Related Knowledge, Behaviours, and Beliefs of Indo-Canadians and Euro-Canadians: Implications for Physical Therapists. Physiotherapy Canada. 2014;66(2):208–17.
- Abbasi IN. Socio-cultural Barriers to Attaining Recommended Levels of Physical Activity among Females: A Review of Literature. Quest. 2014;66(4):448–67.
- Ajaero CK, Wet-Billings ND, Atama C, Agwu P, Eze EJ. The prevalence and contextual correlates of non-communicable diseases among interprovincial migrants and non-migrants in South Africa. BMC Public Health. 2021;21(1):999.
- Modesti PA, Perticone F, Parati G, Agabiti Rosei E, Prisco D. Chronic disease in the ethnic minority and migrant groups: time for a paradigm shift in Europe. Internal and Emergency Medicine. 2016;11:295–7.
- -Koçtürk TO. Food habit changes in a group of immigrant Iranian women In Uppsala (2004). Int Interdisciplinary J. https://hdl.handle.net/1807/3066; 3(2): 27–33.
- 29. -Europe Statistics in Focus. Eating, drinking and smoking. Comparative price levels in EU, EFTA and Candidate countries for 2003. ; 2004.
- -Kelishadi R, Ghatrehsamani S, Mansouri S, Mirmoghtadaee P, Mansouri S, Poursafa P. Barriers to Physical Activity in a Population-based Sample of Children and Adolescents in Isfahan, Iran (2010). Int J Prev Med.; 1(2): 131–137.
- -Withall J, Jago R, Fox KR. Why some do but most don't. Barriers and enablers to engaging low-income groups in physical activity programmes: a mixed methods study (2011). BMC Public Health volume. https://doi.org/10.1186/ 1471-2458-11-507 11: 507.
- -Cooke A, Smith D, Booth A. Beyond PICO: the SPIDER tool for qualitative evidence synthesis (2012). Qual Health Res. https://doi.org/10.1177/10497 323124529 Oct; 22(10): 1435–43.
- Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, The MCD, PRISMA, et al. statement: an updated guideline for reporting systematic review (2000). BMJ. 2020. https://doi.org/10.1136/bmj.n71.
- Meline T. Selecting Studies for Systemic Review: Inclusion and Exclusion Criteria. Contemporary Issues in Communication Science and Disorder. 2006;33:21–7.
- -Joanna Briggs Institute. JBI critical appraisal tools. Critical appraisal tools for use in JBL Systematic Review. Checklist for Qualitative Research. [Online].; 2020 [cited 2022 05 18. Available from: https://jbi.global/critical-appra isal-tools.
- -ReaearchGate. [Online]. [cited 2025 January 25. Available from: https://short url.at/j5p9h.
- 37. -Krippendorff K. Content Analysis: An Introduction to Its Methodology. 2nd ed. Oaks T, editor.: CA: Sage Publications.; 2004.
- -Turk MT, Fapohunda A, Zoucha R. Using photovoice to explore nigerian immigrants' eating and physical activity in the United States (2015). J Nurs Scholarsh. https://doi.org/10.1111/jnu.12105 47(1): 16–24.
- Brathwaite AC, Lemonde M. Health Beliefs and Practices of African Immigrants in Canada (2016). Clinical Nursing Research. https://doi.org/10.1177/ 1054773815587 25(6): 626–645.
- Simonsen SE, Digre KB, Ralls B, Mukundente V, Davis FA, Rickard S, Alder SC. A gender-based approach to developing a healthy lifestyle and healthy weight intervention for diverse Utah women. Evaluation and Program Planning. 2015;51:8–16.
- Janzon E, Bolmsjö I. Obesity in Somali Immigrant Women Due to Post-Migration Dietary Changes and Decreasing Self-Esteem? A Qualitative Interview Study on Diet, Knowledge about Risk of Heart Disease, Inactivity, Body Image and Self-Esteem (2013). Journal of Research in Obesity. 2013. https://doi.org/10.5171/2013.142971Dec.
- Alemu BT, Carlisle KL, Abate SN. First-generation Ethiopian immigrants and beliefs about physical activity (2021). International Journal of Migration, Health, and Social Care. https://doi.org/10.1108/IJMHSC-02-2019-0024; 17(2): 196-207.
- Babatunde-Sowole OO, Power T, Davidson P, Ballard C, Jackson D. Exploring the diet and lifestyle changes contributing to weight gain among Australian West African women following migration: A qualitative study. Contemporary nurse. 2018;54(2):150–9.
- 44. Kaplan SA, Ahmed R, Musah A. "When you walk in the rain, you get wet": A Qualitative Study of Ghanaian Immigrants' Perspective on the

Epidemiological Paradox. Journal of Immigrant and Minority Health. 2015;17:255–62.

- Nicolaou M, Benjelloun S, Stronks K, van Dam RM, Seidell JC, Doak CM. Influences on body weight of female Moroccan migrants in the Netherlands: a qualitative study. Health & Place. 2012;18(4):883–91.
- 46. Addo IY, Brener L, Asante AD, de Wit J. Socio-cultural beliefs about an ideal body size and implications for risk of excess weight gain after immigration: a study of Australian residents of sub-Saharan African ancestry. Ethnicity & Health. 2021;26(8):1209–24.
- -Ibe-Lambert KD, Tshiswaka DI, Fapohunda A. Exploring the Cultural Perceptions of Physical Activity among Transnational Nigerian Immigrants (2018). Journal of Health Disparities Research and Practice. https://digitalscholars hip.unlv.edu/jhdrp/vol11/iss4/3; 11(4).
- Adekeye O, Kimbrough J, Obafemi B, Strack RW. Health literacy from the perspective of African immigrant youth and elderly: a PhotoVoice project. Journal of Health Care for the Poor and Underserved. 2014;25(4):1730–47.
- Himmelgreen D, Romero Daza N, Cooper E, Martinez D. "I don't make the soups anymore": pre-to post-migration dietary and lifestyle changes among Latinos living in West-Central Florida. Ecology of food and nutrition. 2007;46(5–6):427–44.
- Silove D, Sinnerbrink I, Field A, Manicavasagar V, Steel Z. Anxietym depression and PTSD in asylum-seekers: Association with pre-migration trauma and post-migration stressors. Br J Psychiatry. 1997;170(4):351–7.
- MacKinnon MJ, Picchio CA, Nomah DK, Segura AR, Selm LV, Fernández E, Lazarus JV. Chronic conditions and multimorbidity among West African migrants in greater Barcelona. Spain Frontiers in Public Health. 2023;11:1142672.
- -Adhunga JO. Woman as Mother and Wife in the African Context of the Family in the Light of John Paul II's Anthropological and Theological Foundation: Xlibris; 2014
- -Finnish National Board on Research Integrity TENK. TENK Ethical Review. [Online].; 2021 [cited 2022 11 2. Available from: https://tenk.fi/en/ethicalreview/ethical-review-human-sciences.
- Lindsay AC, Sussner KM, Greaney ML, Peterson KE. Influence of Social Context on Eating, Physical Activity, and Sedentary Behaviors of Latina Mothers and Their Preschool-Age Children. Health Education & Behavior. 2009;36(1):81–96.
- 55. Addo IY, Brener L, Asante AD, de Wit J. Determinants of post-migration changes in dietary and physical activity behaviours and implications for health promotion: Evidence from Australian residents of sub-Saharan African ancestry. Health Promotion Journal of Australia. 2019;30:62–71.

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