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# Seniors and Sustenance: A Scoping Review on Food Security in the Elderly

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## Abstract

The issue of food security amongst older people is a growing concern, as ageing populations face unique challenges that impact their access to adequate nutrition. This scoping review aims to explore and synthesise existing literature on food security in later life, identifying key factors contributing to food insecurity amongst seniors and highlighting interventions that can enhance food access. By employing a systematic approach based on Arksey and O'Malley's framework, this study examines research from multiple databases, focussing on studies published in the past decade. The findings reveal a multifaceted problem influenced by socio-economic status, health limitations, social isolation and geographic barriers. Elderly individuals often encounter mobility issues that hinder their ability to procure food, while fixed incomes and rising costs exacerbate their access to nutritious options. In addition, the review identifies successful community-based programmes and policy initiatives that have shown promise in addressing these challenges, emphasising the importance of tailored interventions that consider the specific needs of older people. The analysis highlights significant gaps in the current literature, particularly in the areas of culturally sensitive programmes and the long-term effects of food insecurity on mental health. Furthermore, the role of technology in mitigating food insecurity presents a promising yet underexplored avenue for future research. The review underscores the critical need for comprehensive strategies integrating policy, community support and technological innovations to effectively combat food insecurity amongst seniors. By addressing these issues, stakeholders can improve the overall quality of life and health outcomes for the elderly population, ensuring their nutritional needs are met sustainably.

**Keywords:** Ageing populations, community programmes, elderly, food security, health outcomes, interventions, nutrition, policy initiatives, social isolation, socio-economic status

## INTRODUCTION

Food insecurity is a critical public health issue.<sup>[1]</sup> Food security is defined by the Food and Agriculture Organisation as a state where all people have consistent physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life.<sup>[2,3]</sup> Food insecurity is defined as 'limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire acceptable foods in socially acceptable ways'.<sup>[4]</sup> Within the context of an ageing population, the importance of food security is magnified, as older adults often encounter distinct challenges that exacerbate food insecurity.<sup>[5,6]</sup> Geriatric populations, typically defined as individuals aged 65 years and older, face increased vulnerability due to

factors such as fixed incomes, declining health and social isolation.<sup>[4,7-9]</sup>

Addressing food security issues amongst seniors is imperative, as nutritional status is directly linked to health outcomes.<sup>[4,10]</sup> Malnutrition in older adults can lead to several adverse health effects, including weakened immune function, an increased risk of chronic diseases and cognitive decline.<sup>[11-13]</sup> Furthermore,

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food insecurity is associated with mental health issues, such as depression and anxiety, which further complicate the overall well-being of elderly individuals.<sup>[14-16]</sup> It has been appraised that the global population aged 60 years and older is projected to reach 2.1 billion by 2050; addressing food security in this demographic is increasingly urgent.<sup>[17-20]</sup>

This scoping review aims to systematically explore and synthesise existing literature on food security in geriatric populations [Figure 1]. It seeks to identify the key factors contributing to food insecurity amongst older adults and evaluate effective interventions and policies that improve food access. By applying a comprehensive methodology, this review will illuminate gaps in current research and suggest areas for future investigation. Ultimately, the objective is to provide a nuanced understanding of seniors' challenges in accessing adequate nutrition and inform stakeholders about strategies to enhance food security in later life.

## MATERIALS AND METHODS

This scoping review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews guidelines to ensure a systematic and transparent approach [Figure 2].<sup>[21]</sup> The aim was to map the existing literature on food security within geriatric populations, identify key themes and highlight areas requiring further investigation

A comprehensive search strategy was developed in collaboration with a research librarian.<sup>[22]</sup> The search was executed across multiple electronic databases, including PubMed, MEDLINE and CINAHL, using a combination of keywords and Medical Subject Headings (MeSH) terms such as 'food security', AND 'elderly', AND 'older adults', AND 'nutrition', AND

'geriatric'. The search was limited to studies published from 2014 onwards to capture the most recent developments in the field.

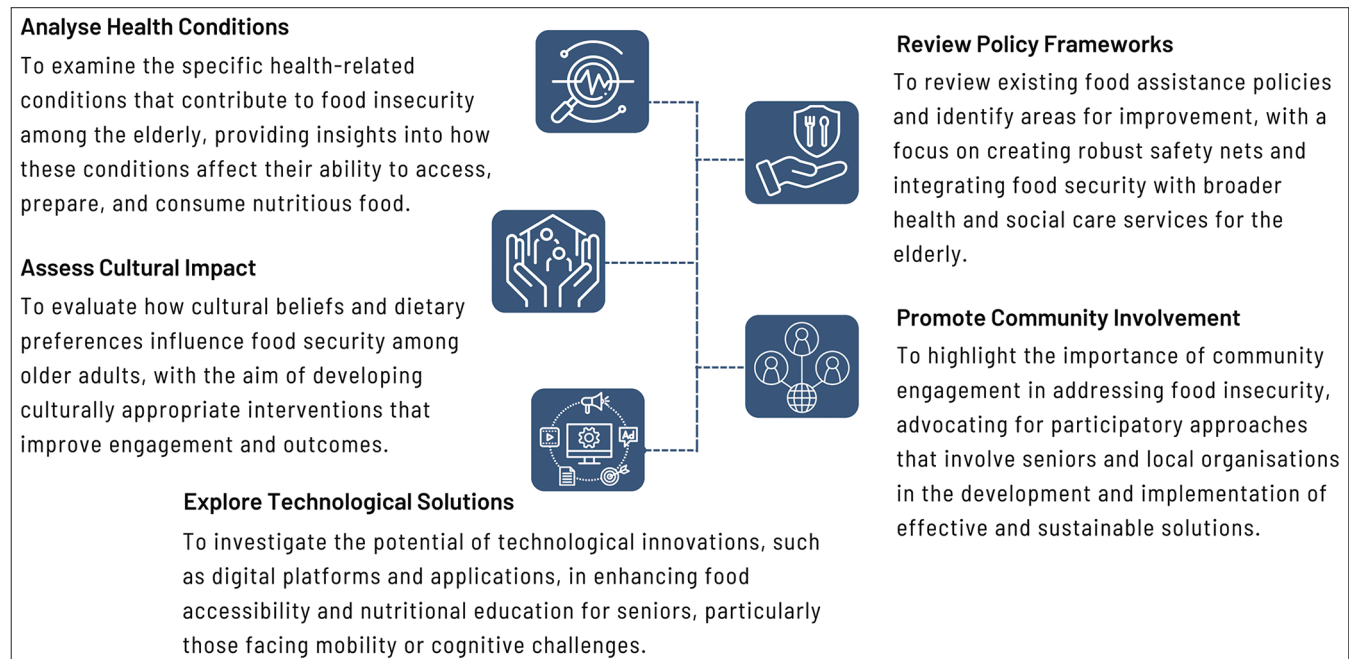
Studies were included if they met the following criteria: (1) focussed on food security amongst individuals aged 65 years and older; (2) published in peer-reviewed journals; (3) available in English and (4) provided empirical data or reviews of interventions, policies, or programmes related to food security in older adults. Exclusion criteria were: (1) studies focussing on populations younger than 65 years; (2) articles not peer-reviewed, such as opinion pieces, editorials or conference abstracts and (3) studies not directly addressing food security or related health outcomes amongst seniors.

Two independent reviewers performed data extraction to minimise bias and ensure consistency. A standardised data extraction form was used to collect information on study characteristics, such as authors, year of publication, study design, population, key findings and recommendations. Discrepancies between reviewers were resolved through discussion or by consulting a third reviewer.

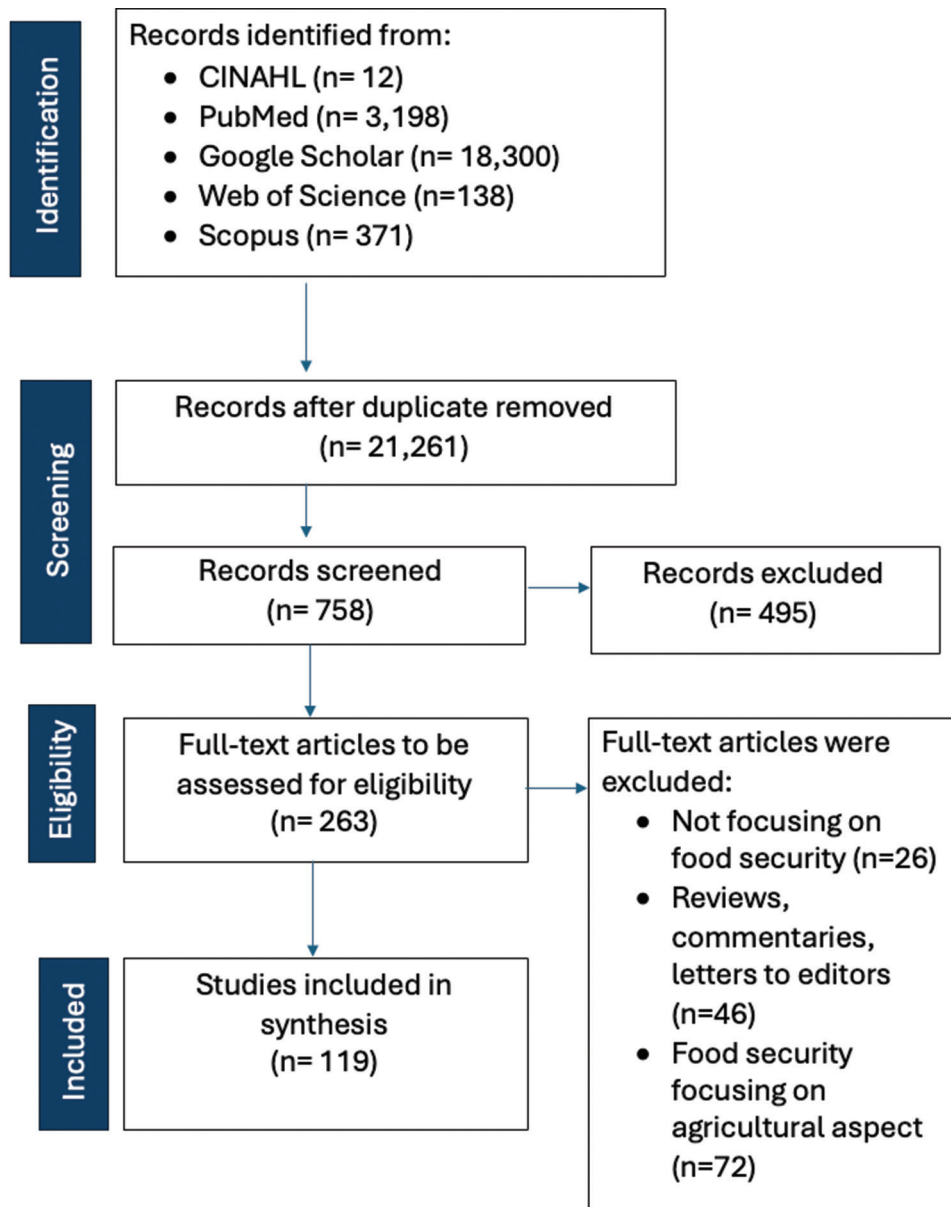
To control potential bias, a dual-reviewer system was employed at each stage of the review process, from study selection to data extraction. Conflicts of interest were noted and addressed to ensure the integrity of the review.

## INTERPRETING THE CHALLENGES: KEY DRIVERS OF FOOD INSECURITY IN GERIATRIC POPULATIONS

Food insecurity amongst geriatric populations is a multifaceted issue influenced by various interrelated factors.<sup>[22,23]</sup> One of the primary drivers of food insecurities is economic instability,<sup>[24]</sup>



**Figure 1:** Objectives of the scoping review. Illustration Credit: Nor Faiza Mohd. Tohit.



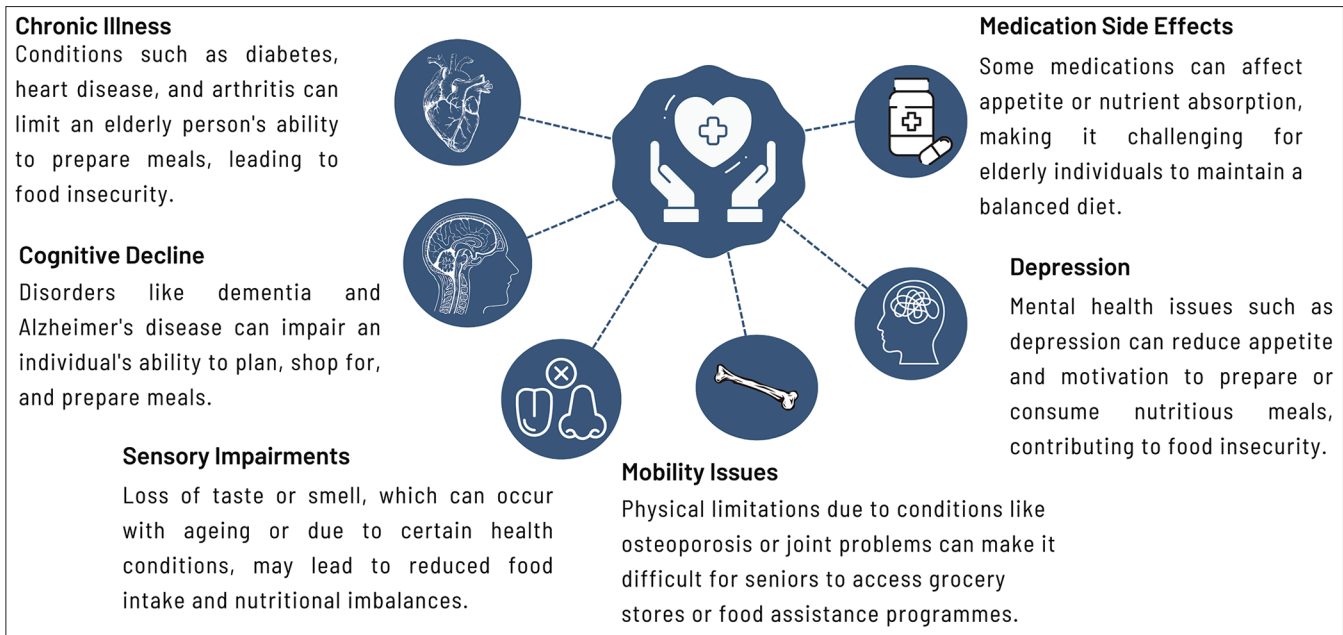
**Figure 2:** Materials and methods according to Prisma-ScR guidelines. Illustration Credit: Nor Faiza Mohd. Tohit.

which is particularly pertinent for older adults living on fixed incomes such as pensions or retirement savings.<sup>[16]</sup> The rising cost of food,<sup>[25,26]</sup> living<sup>[27,28]</sup> and inadequate financial resources limit their ability to purchase sufficient and nutritious food.<sup>[29,30]</sup> Studies have shown that older adults experiencing financial strain are more likely to report food insecurity, underscoring the need for targeted financial assistance programmes.<sup>[31-33]</sup>

Health-related challenges also significantly contribute to food insecurity in seniors [Figure 3].<sup>[34]</sup> Many older adults suffer from chronic illnesses, disabilities or cognitive impairments that hinder their ability to shop for and prepare meals.<sup>[35-38]</sup> The physical limitations associated with conditions such as arthritis or mobility issues can make it difficult for seniors to access grocery stores, leading to reliance on convenience

foods that are often less nutritious and more expensive.<sup>[39,40]</sup> Furthermore, mental health issues, including depression and social isolation, can diminish motivation and the ability to manage dietary needs effectively.<sup>[41,42]</sup>

Social factors also play a crucial role in food insecurity amongst older adults.<sup>[43,44]</sup> Many seniors experience social isolation, which can limit their access to social support networks that facilitate food procurement and preparation.<sup>[45-48]</sup> Community engagement and family support systems are significant protective factors against food insecurity; thus, the absence of these networks can exacerbate the issue.<sup>[49,50]</sup> In addition, cultural factors, including dietary preferences and traditions, may affect food choices, leading to further complications in meeting nutritional requirements.<sup>[51,52]</sup>



**Figure 3:** Health-related conditions that cause food insecurity. Illustration Credit: Nor Faiza Mohd. Tohit.

Geographic location also influences food security.<sup>[53]</sup> Many older adults reside in food deserts – areas with limited access to affordable and nutritious food – making it challenging to maintain a healthy diet.<sup>[54,55]</sup> This geographical disparity often correlates with socio-economic status, as low-income seniors in these regions may face additional barriers, such as transportation difficulties, that impede their ability to obtain food.<sup>[56,57]</sup>

Food insecurity in geriatric populations is driven by economic, health-related, social and geographic factors.<sup>[8,58-60]</sup> Addressing these challenges requires a comprehensive approach that considers the diverse needs of older adults and implements strategies that enhance their food security and overall well-being.<sup>[61,62]</sup>

## HEALTH IMPLICATIONS OF FOOD INSECURITY AMONGST GERIATRIC POPULATIONS

Food insecurity poses significant health risks for the senior population, impacting both physical and mental health outcomes.<sup>[63-65]</sup> Older adults who experience food insecurity are at a heightened risk for malnutrition,<sup>[31]</sup> which can lead to various health complications,<sup>[35,66]</sup> including muscle weakness,<sup>[67]</sup> impaired immune function<sup>[68,69]</sup> and increased susceptibility to chronic noncommunicable diseases (NCDs).<sup>[70,71]</sup> Malnutrition in seniors is particularly concerning because it can exacerbate existing health conditions, leading to hospitalisations and a decline in overall health status.<sup>[72,73]</sup>

One of the most critical health implications of food insecurity is its association with chronic illnesses.<sup>[74-76]</sup> Research indicates that food-insecure older adults are more likely to have conditions such as diabetes,<sup>[77]</sup> hypertension<sup>[78]</sup> and cardiovascular diseases.<sup>[79,80]</sup> Unable access to nutritious

foods often results in poor dietary choices, worsening these chronic NCDs.<sup>[81,82]</sup> It is, for instance, a diet low in fruits, vegetables and whole grains and high in processed foods can lead to uncontrolled blood sugar levels in diabetic patients and contribute to heart disease.<sup>[83-85]</sup>

In addition, food insecurity is linked to cognitive decline in older adults. Studies have shown that inadequate nutrition can affect cognitive function, leading to memory problems and an increased risk of dementia.<sup>[86-88]</sup> The stress associated with food insecurity may further compound this issue, as chronic stress has been shown to impact cognitive health negatively.<sup>[89]</sup> Mental health is also significantly affected; food-insecure seniors often report higher levels of anxiety and depression, which can create a vicious cycle where poor mental health leads to further food insecurity.<sup>[90,91]</sup>

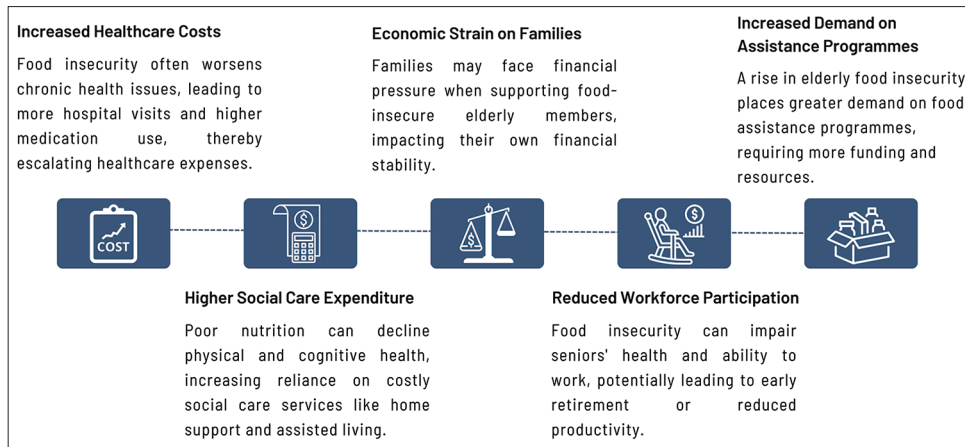
The social implications of food insecurity cannot be overlooked. Older adults who struggle with accessing food often face social isolation, which can result in diminished mental and emotional well-being.<sup>[7,48,92]</sup> The stigma associated with food insecurity may prevent seniors from seeking help, further exacerbating feelings of loneliness and depression.<sup>[7,48]</sup>

Moreover, food insecurity can lead to several financial implications [Figure 4], such as increased healthcare costs due to the higher prevalence of chronic diseases and mental health issues amongst affected individuals.<sup>[93,94]</sup> This economic burden affects individuals and strains the healthcare system<sup>[95-100]</sup>

## EVALUATING CURRENT INTERVENTIONS: SUCCESSES AND LIMITATIONS

Addressing food insecurity amongst the senior population has prompted various interventions, ranging from community-based





**Figure 4:** Financial implication of food insecurity in older people. Illustration Credit: Nor Faiza Mohd. Tohit.

programmes to policy initiatives. These interventions aim to improve access to nutritious food and enhance the overall well-being of older adults. While many programmes have demonstrated success, they also face limitations that affect their effectiveness and sustainability.<sup>[20,54,101-103]</sup>

One successful intervention is the establishment of food banks and pantries tailored explicitly for seniors. These initiatives provide immediate relief by offering free or low-cost access to food. Research indicates that seniors who utilise these services report improved food security and better health outcomes.<sup>[104-106]</sup> Many food banks have begun partnering with local health organisations to offer nutritional education alongside food distribution, helping senior community members make healthier food choices.<sup>[107,108]</sup> However, these programmes often encounter stigma-related challenges, as many older adults may feel embarrassed or reluctant to seek assistance. This stigma can limit participation, particularly those benefitting most from such services.<sup>[109-111]</sup>

Another effective intervention is the implementation of home-delivered meal programmes, such as meals on wheels. These programmes provide nutritious meals and social interaction, which are crucial for combating seniors' loneliness and isolation.<sup>[112-114]</sup> Studies have shown that participants in these programmes experience higher levels of food security and improved nutritional intake.<sup>[115,116]</sup> However, logistical challenges, such as funding and volunteer shortages, can hinder the sustainability of these programmes. In addition, the quality and variety of food provided can vary, potentially limiting their effectiveness.<sup>[117,118]</sup>

Policy initiatives, such as the Supplemental Nutrition Assistance Program (SNAP) in the United States, significantly address food insecurity amongst older adults. Programmes like SNAP provide financial assistance for purchasing food, which can substantially alleviate food insecurity.<sup>[119,120]</sup> Evaluations have shown that participation in such programmes correlates with increased food security and improved health outcomes.<sup>[121,122]</sup> However, barriers to accessing these programmes, including complex application processes and lack of awareness, can limit their reach and effectiveness.<sup>[123,124]</sup>

Furthermore, funding constraints can lead to cuts in benefits, disproportionately affecting vulnerable populations, including elderly communities.<sup>[125]</sup>

Community gardens and urban, e.g. roof or vertical agriculture initiatives have emerged as innovative solutions to foster food security amongst elderly populations.<sup>[126-129]</sup> These programmes provide fresh produce and encourage social interaction and physical activity, contributing to overall health.<sup>[130]</sup> While these initiatives have succeeded in building community and enhancing food access, they often require significant resources and commitment from participants, which can be challenging for seniors with mobility or health issues.<sup>[131,132]</sup>

While various interventions have shown promise in addressing food insecurity amongst geriatric populations, they are not without limitations [Figure 5].<sup>[133,134]</sup> Stigma, logistical challenges and barriers to access can hinder the effectiveness of these programmes.<sup>[135]</sup> A multifaceted approach that combines immediate relief efforts with long-term policy changes and community engagement is essential for creating sustainable solutions.<sup>[136-138]</sup> Future interventions must prioritise inclusivity and accessibility to ensure that all seniors benefit from available resources.<sup>[139,140]</sup>

## THE ROLE OF POLICY IN ALLEVIATING FOOD INSECURITY FOR SENIORS

Food insecurity amongst seniors is an urgent public health issue that necessitates effective policy interventions to address older adults' unique challenges [Figure 6].<sup>[20]</sup> Various strategies, including financial assistance programmes, community initiatives and national policies, have been implemented to mitigate food insecurity in different contexts, including Malaysia and other countries.<sup>[141-143]</sup>

In Malaysia, the government has acknowledged food insecurity as a critical concern, particularly amongst vulnerable populations such as seniors. The Bantuan Sara Hidup [(BSH) living allowance] program is a key policy measure that provides direct cash transfers to low-income households,

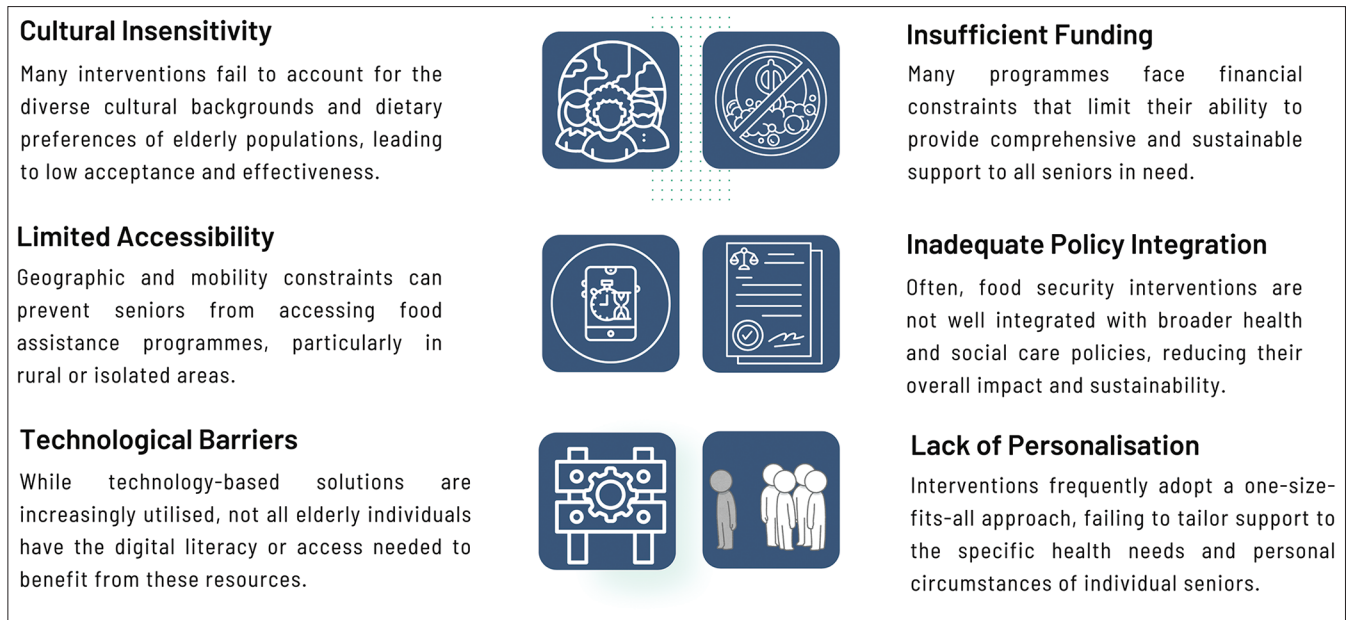


Figure 5: Limitations of interventions to address food insecurity in older people. Illustration Credit: Nor Faiza Mohd. Tohit.

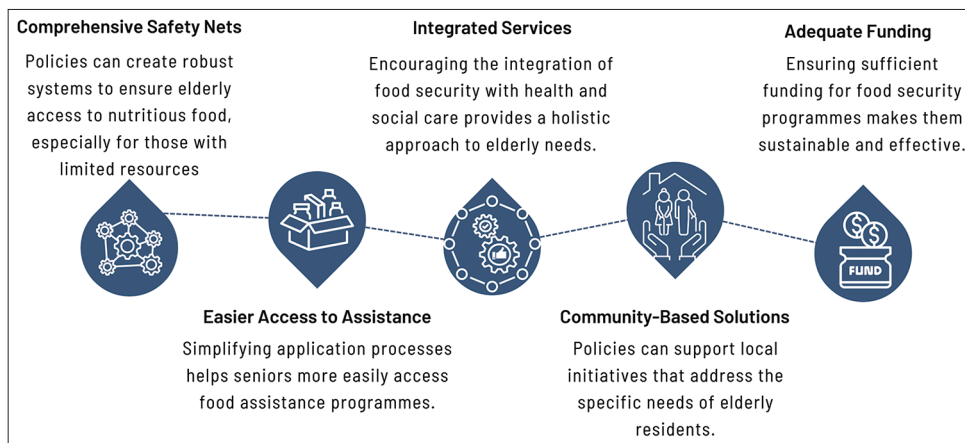


Figure 6: The role of policy in alleviating food insecurity for seniors. Illustration Credit: Nor Faiza Mohd. Tohit.

including older adults. This financial assistance helps seniors purchase essential food items and meet their nutritional needs, improving their food security.<sup>[144,145]</sup> Studies have shown that such direct financial support significantly enhances the ability of seniors to access nutritious food, ultimately contributing to better health outcomes.<sup>[146,147]</sup>

Another important initiative in Malaysia is the ‘Rancangan Makanan Tambahan’ ([RMT] Supplementary Food Plan), which provides supplementary food to vulnerable groups, including older people, to ensure they receive essential nutrients. This program aims to combat malnutrition and promote the overall health of older adults.<sup>[148,149]</sup> However, challenges such as awareness of these programmes and accessibility remain critical barriers that must be addressed to maximise their effectiveness.<sup>[150,151]</sup>

In contrast, countries like the United States have implemented robust food assistance programmes, such as the SNAP, which

provides financial aid for purchasing food.<sup>[119]</sup> Research indicates that participation in SNAP is associated with increased food security amongst older adults, leading to improved health outcomes and reduced healthcare costs.<sup>[152,153]</sup> Similarly, in the United Kingdom, the Pension Credit scheme supports low-income seniors by increasing their disposable income, enabling them to afford sufficient food and essential services.<sup>[154-156]</sup>

Community-based initiatives are also vital in alleviating food insecurity for seniors across different countries. Urban gardening projects and community food banks have emerged as innovative solutions to provide older adults with fresh produce and essential food items.<sup>[157,158]</sup> For example, community food initiatives in Canada have improved food access while fostering social connections amongst seniors and combating isolation and loneliness.<sup>[159,160]</sup> These programmes enhance food security and promote a sense of community and belonging.<sup>[161-164]</sup>

Moreover, public health policies that promote nutrition education are essential in equipping seniors with the knowledge and skills required to make healthy food choices. Educational programmes can empower older adults to navigate food assistance systems, understand nutritional information and develop healthy cooking skills, enhancing food security.<sup>[165-168]</sup> In Australia, initiatives focussed on nutrition education for seniors have demonstrated positive outcomes in improving dietary habits and food access.<sup>[169,170]</sup>

Despite these efforts, systemic barriers to food security still exist, including the stigma of seeking assistance and the variability in programme quality and accessibility.<sup>[171,172]</sup> Policymakers must consider these barriers when designing interventions and ensure that seniors' voices are included in the policymaking process.<sup>[173-175]</sup> Inclusive policies that engage older adults in decision-making can lead to more effective and tailored solutions. Effective policy interventions are crucial for alleviating food insecurity amongst seniors.<sup>[176]</sup> By providing financial assistance, promoting community engagement and fostering nutrition education, governments can significantly enhance the quality of life for older adults.<sup>[177-179]</sup> A multifaceted approach that addresses the diverse needs of seniors is essential for creating sustainable solutions that improve food security and overall well-being.<sup>[180,181]</sup>

## COMMUNITY-BASED SOLUTIONS: BRIDGING THE GAP FOR FOOD INSECURITY AMONGST THE ELDERLY

Food insecurity amongst elderly populations is a pressing issue that requires innovative and sustainable solutions.<sup>[8,177,182,183]</sup> Community-based initiatives have emerged as practical strategies to address this challenge, bridging the gap between vulnerable seniors and access to nutritious food.<sup>[54]</sup> These programmes provide immediate relief, foster social connections and enhance the overall well-being of older adults.<sup>[6,54,64]</sup>

One prominent community-based solution is the establishment of community food banks and pantries tailored explicitly for seniors. These initiatives aim to provide essential food items at no cost or a reduced price, ensuring that older adults can access nutritious options.<sup>[105,184]</sup> Research indicates that seniors utilising food pantries report improved food security and health outcomes.<sup>[185]</sup> These food banks can collaborate with local organisations to offer culturally appropriate foods that meet older adults' dietary preferences and needs, increasing utilisation and satisfaction.<sup>[186]</sup>

Another practical approach is the implementation of meal delivery programmes, such as meals on wheels. These services deliver freshly prepared meals directly to seniors' homes, ensuring they receive adequate nutrition, especially those with mobility issues or limited access to transportation.<sup>[187]</sup> Beyond addressing food insecurity, these programmes also provide social interaction, which is vital in combating loneliness and isolation amongst older adults. Studies have shown that

participants in meal delivery programmes often experience improved mental health and overall well-being.<sup>[188]</sup>

Community gardening initiatives represent another innovative solution to food insecurity. By encouraging seniors to participate in community gardens, these programmes provide access to fresh produce while promoting physical activity and social engagement. Gardening helps alleviate food insecurity and fosters a sense of community and belonging amongst participants.<sup>[189,190]</sup> Furthermore, educational workshops can be incorporated into these programs, teaching seniors about nutrition, cooking and sustainable gardening practices, empowering them to make healthier food choices.<sup>[176,191]</sup>

Partnerships with local businesses and farmers can enhance these community-based solutions by providing fresh, locally sourced produce to food banks and meal programs. Such collaborations can create a sustainable food system that benefits seniors and local producers.<sup>[171]</sup> In addition, initiatives that involve intergenerational engagement, where younger community members assist seniors in food-related activities, can foster connections and create a supportive network for older adults.<sup>[178,180,192,193]</sup>

Community-based solutions play a critical role in bridging the gap in food insecurity amongst older people. By providing access to nutritious food, fostering social connections and promoting empowerment through education, these initiatives can significantly enhance the quality of life for older adults. A collaborative approach that involves local organisations, businesses and community members is essential for creating sustainable and practical solutions to address food insecurity in this vulnerable population.<sup>[54,142,194]</sup>

## TECHNOLOGICAL ADVANCEMENTS: OPPORTUNITIES FOR IMPROVED FOOD SECURITY

In the face of rising food insecurity, technological advancements present significant opportunities to enhance food security, particularly for vulnerable populations such as older people.<sup>[195,196]</sup> Agriculture, food distribution and data management innovations can help improve access to nutritious food, reduce waste and strengthen food systems.<sup>[197-200]</sup> Malaysia and other countries around the globe have begun to harness these technologies to address the pressing challenge of food insecurity.<sup>[201,202]</sup>

One of the most notable advancements in agricultural technology is precision farming. This approach uses data analytics, satellite imagery and Internet of Things devices to optimize farming practices. Farmers can make informed decisions about when to plant, irrigate and harvest by monitoring soil conditions, weather patterns and crop health.<sup>[203-206]</sup> In Malaysia, for instance, the government has promoted precision agriculture to increase crop yields and minimise resource use. The Malaysian Agricultural Research and Development Institute has implemented drone technology and remote sensing projects to enhance paddy and vegetable



farming productivity.<sup>[207,208]</sup> Such technological advancements boost food production and contribute to the long-term sustainability of agricultural practices, thereby improving food availability.<sup>[200,209]</sup>

Another technological innovation with significant potential is vertical farming, which allows for the cultivation of crops in controlled environments, often within urban settings.<sup>[210-212]</sup> Vertical farms utilise hydroponics or aeroponics, using less water and land than traditional farming methods.<sup>[213]</sup> In Singapore, for example, vertical farming initiatives have gained traction as a solution to the limited land availability in the city-state.<sup>[214]</sup> Companies like Sky Greens have successfully implemented vertical farming systems, producing fresh vegetables for local consumption.<sup>[215]</sup> This method reduces the carbon footprint associated with food transportation, ensuring that urban populations can access fresh produce while addressing food security.<sup>[216,217]</sup>

Food distribution technologies also play a crucial role in improving food security. Online grocery platforms and mobile applications have become increasingly popular, especially during the COVID-19 pandemic, as they provide greater access to food for those with mobility challenges, including older people.<sup>[218,219]</sup> In Malaysia, platforms such as HappyFresh and GrabMart have emerged, offering home delivery services for groceries and essential items.<sup>[220]</sup> These services enable seniors to access a wide variety of food products without needing to visit physical stores, thus enhancing convenience and food access.<sup>[222,223]</sup>

Furthermore, blockchain technology is being explored to increase transparency and traceability in food supply chains. By providing a secure and immutable record of food movement from farm to table, blockchain can help address food safety and quality issues.<sup>[224,225]</sup> Countries like the Netherlands have adopted blockchain solutions to track the origin of food products, ensuring that consumers receive safe and high-quality items.<sup>[226,227]</sup> This level of transparency can build consumer trust and promote food security by reducing waste and inefficiencies in the supply chain.<sup>[228]</sup>

Data analytics and artificial intelligence (AI) can also enhance food security by predicting demand patterns and optimising supply chain management.<sup>[229,230]</sup> By analysing market trends and consumer behaviour, businesses can make informed decisions about inventory management, reducing food waste and ensuring food reaches those in need.<sup>[231]</sup> In Malaysia, data-driven approaches are being integrated into food policy planning, enabling better allocation of resources and more effective responses to food insecurity challenges.<sup>[197,232,233]</sup>

## CULTURAL CONSIDERATIONS AND DIETARY PREFERENCES IN ADDRESSING FOOD INSECURITY AMONGST SENIORS

Food insecurity amongst seniors is a complex issue that requires a nuanced understanding of cultural considerations and dietary preferences.<sup>[4]</sup> As older adults come from diverse

backgrounds, their food choices, nutritional needs and barriers to accessing food are often influenced by cultural factors.<sup>[234,235]</sup> Recognising and integrating these cultural dimensions into food security interventions is essential for promoting the well-being of elderly populations.<sup>[236]</sup>

Cultural beliefs and practices significantly shape dietary preferences amongst seniors.<sup>[237,238]</sup> Traditional diets often reflect specific communities' history, values and agricultural practices.<sup>[239,240]</sup> For instance, in Malaysia, where a rich tapestry of ethnicities such as Malay, Chinese and Indian coexist, dietary preferences vary widely. Malay cuisine is often characterised by rice, spices and coconut milk, while Chinese cuisine may emphasize noodles, vegetables and seafood.<sup>[241,242]</sup> Understanding these preferences is crucial when designing food assistance programs. Providing culturally appropriate foods not only encourages acceptance and utilisation of food aid but also helps maintain the cultural identity of seniors, which is vital for their mental and emotional well-being.<sup>[243]</sup>

Moreover, cultural considerations extend to food preparation and consumption practices. Many older people have preferred specific cooking methods or traditional recipes integral to their cultural identity.<sup>[239,244-246]</sup> Programmes that offer cooking classes or nutritional education should consider these preferences. For example, teaching seniors how to prepare healthy versions of traditional recipes can empower them to make better food choices while respecting their cultural heritage. This approach enhances food security and promotes a sense of pride and ownership over their dietary habits.<sup>[247-249]</sup>

Language barriers can also pose significant challenges for seniors from diverse cultural backgrounds. Many older people were not proficient in the dominant language of their country, making it difficult for them to access information about food assistance programmes or understand nutritional guidelines.<sup>[250-253]</sup> Thus, providing resources and support in multiple languages is essential to ensure that all seniors benefit from available services. Community outreach initiatives that involve bilingual staff or volunteers can help bridge this gap and foster an inclusive environment for seniors.<sup>[254-256]</sup>

Furthermore, social and religious practices can influence dietary restrictions and preferences. For instance, many Muslims adhere to halal nutritional laws, while Hindus may avoid beef. When planning food assistance programmes, it is crucial to consider these dietary restrictions to ensure that the food provided aligns with seniors' cultural and religious beliefs.<sup>[238,257-259]</sup> Failure to do so can lead to food wastage and a lack of participation in food programs.<sup>[260,261]</sup>

Community involvement is vital in addressing the cultural needs of seniors facing food insecurity. Engaging local leaders and organisations that understand the community's cultural context can help design effective interventions.<sup>[58,142]</sup> For instance, partnerships with cultural associations can facilitate the provision of culturally relevant foods and promote community-based solutions to food insecurity.<sup>[186]</sup> Moreover,

involving seniors in developing and implementing these programmes ensures their voices are heard, leading to more relevant and practical solutions.<sup>[262]</sup>

Addressing food insecurity amongst senior community members requires a comprehensive understanding of cultural considerations and dietary preferences. By incorporating these factors into food assistance programs, policymakers and organisations can foster greater acceptance and utilisation of services.<sup>[4,20,62,171]</sup> Ensuring that food is culturally appropriate, respecting dietary restrictions and involving the community in program design are essential to promoting food security for elderly populations.<sup>[236,263]</sup> By recognising the cultural dimensions of food, we can enhance the health and well-being of seniors, ultimately improving their quality of life.<sup>[264-267]</sup>

## ADDRESSING RESEARCH GAPS: FUTURE DIRECTIONS AND OPPORTUNITIES IN FOOD INSECURITY FOR SENIORS

Food insecurity remains a significant challenge for senior populations worldwide, and while substantial research has been conducted, critical gaps persist that need to be addressed to develop comprehensive solutions.<sup>[6]</sup> Identifying these gaps and exploring future directions is essential for improving the effectiveness of interventions and ensuring that the nutritional needs of older adults are adequately met.<sup>[268]</sup>

One primary research gap is the lack of longitudinal studies<sup>[269]</sup> examining food insecurity's long-term effects on seniors' health outcomes.<sup>[270]</sup> Most existing studies offer cross-sectional data, which provides a snapshot but fails to capture the dynamic nature of food insecurity over time.<sup>[271-273]</sup> Longitudinal research could provide insights<sup>[274]</sup> into how persistent food insecurity affects physical health,<sup>[275]</sup> mental well-being,<sup>[15,17]</sup> and healthcare utilisation amongst seniors,<sup>[276]</sup> allowing for the development of proactive and preventative interventions.<sup>[277,278]</sup>

Furthermore, there is a need for more culturally sensitive research that considers the diverse backgrounds of senior populations. While cultural considerations significantly influence dietary preferences and food access, existing research often adopts a one-size-fits-all approach.<sup>[279-282]</sup> Future studies should incorporate culturally specific factors, examining how different traditions, beliefs and practices impact food security amongst various ethnic groups.<sup>[62,236,243,283]</sup> This can aid in designing targeted interventions that respect and incorporate cultural diversity, thus improving programme uptake and effectiveness.

Technological advancements offer promising opportunities for addressing food insecurity, yet research on their application amongst seniors is limited. Studies are needed to explore the potential of digital platforms, mobile applications and other tech-driven solutions to facilitate food access and education for seniors.<sup>[223,284]</sup> For instance, examining how technology can streamline food delivery services or provide nutritional education tailored to seniors' needs could bridge existing gaps in access and knowledge.<sup>[285-287]</sup>

Moreover, there is a significant opportunity to explore the role of social networks and community support in mitigating food insecurity amongst older adults.<sup>[54,288]</sup> Research should investigate how social connections, such as family ties, friendship networks and community groups, can be leveraged to enhance food security. Understanding these dynamics could lead to developing community-based interventions that provide food and foster social inclusion and support.<sup>[101,142]</sup>

Policy-oriented research is also crucial in identifying effective strategies for addressing food insecurity at the systemic level. Evaluating the impact of current food assistance policies and identifying areas for improvement can guide policymakers in designing more effective programs.<sup>[142]</sup> In addition, comparative studies across different countries can offer valuable insights into successful policy models that can be adapted and implemented in various contexts.<sup>[197]</sup>

In conclusion, addressing research gaps in food insecurity amongst seniors is critical for developing practical solutions that cater to their unique needs. Longitudinal studies, culturally sensitive research and exploration of technological and social innovations present significant opportunities for future research. By focussing on these areas, researchers can contribute to a more comprehensive understanding of food insecurity and help shape inclusive, sustainable and effective interventions. Such efforts will ultimately enhance senior populations' well-being and quality of life globally.

## IMPLICATIONS FOR PRACTICE AND POLICY: MOVING FORWARD TO ENHANCED FOOD SECURITY FOR THE ELDERLY

Achieving enhanced food security for older people is a multifaceted challenge requiring coordinated efforts in practice and policy. As populations age globally, addressing food insecurity amongst seniors becomes increasingly critical. Focussed interventions that consider the diverse needs of older adults are essential for promoting their health and well-being.<sup>[4,6]</sup>

One key implication for practice is the need for more personalised and culturally sensitive food assistance programmes. When designing food programmes, service providers should consider seniors' diverse cultural backgrounds and dietary preferences.<sup>[238]</sup> This includes offering culturally appropriate meals and ensuring nutritional education respects traditional dietary practices. Providers can improve programme participation and efficacy by tailoring these programmes to meet the specific needs of different cultural groups.<sup>[238]</sup> Multiple studies reported that culturally tailored interventions to mitigate food insecurity can significantly increase engagement amongst diverse senior populations.<sup>[136,236,289,290]</sup>

Technology offers numerous opportunities to enhance food security amongst older people and its integration into practice should be prioritised. Digital platforms can be leveraged to provide seniors with easier access to food delivery services,

nutritional information and social support networks.<sup>[287]</sup> For instance, mobile applications facilitating grocery ordering and meal planning can help seniors overcome mobility challenges and ensure consistent access to nutritious food. Training programmes to improve digital literacy amongst older adults can further support this initiative, enabling them to utilise technology to meet their dietary needs confidently.<sup>[222]</sup> A study in Australia highlighted the positive impact of digital literacy programmes on improving food security amongst seniors.<sup>[286]</sup>

From a policy perspective, there is a pressing need to re-evaluate and strengthen existing food assistance policies. Policymakers should focus on creating more robust safety nets that effectively address the unique challenges faced by seniors. This includes simplifying application processes for food assistance programmes and ensuring that benefits are adequate to meet the rising living costs.<sup>[194]</sup> In addition, policies should aim to integrate food security with broader health and social care services, recognising the interconnected nature of these issues.<sup>[291-293]</sup> In Canada, integrated policy approaches have improved food security outcomes for older adults.<sup>[25,294]</sup>

Community engagement and collaboration are also crucial components of practical policy development. Policymakers should actively involve seniors and community organisations in the decision-making process to ensure that policies are responsive to the real needs of older adults.<sup>[295-297]</sup> This participatory approach can lead to more effective and sustainable solutions that empower communities to support their elderly members actively.<sup>[298-301]</sup> Studies in the US have demonstrated the benefits of involving community stakeholders in policy formulation for enhancing food security.<sup>[135]</sup>

Furthermore, addressing the systemic barriers to food security [Figure 7] requires a comprehensive approach encompassing economic, social and environmental dimensions.<sup>[302]</sup> Policymakers should consider the impact of broader economic policies on food security, such as housing, healthcare and transportation, which can all affect a senior's ability to access food.<sup>[143]</sup> Integrating food security into national and local policy agendas as a cross-cutting issue can ensure that it receives the attention and resources necessary for meaningful progress.<sup>[303-306]</sup>

## LIMITATIONS OF THIS SCOPING REVIEW

While invaluable in mapping the breadth of existing research, a scoping review on food insecurity amongst older people presents several inherent limitations [Figure 8]. First, the nature of a scoping review prioritises breadth over depth, aiming to explore the extent of the literature comprehensively rather than delve into detailed analysis or critique. While beneficial for identifying gaps and trends, this approach may result in the oversight of nuanced insights or detailed evaluations crucial for a deeper understanding of complex issues.

In addition, the quality of sources included in a scoping review can vary significantly, as these reviews do not typically assess the methodological rigor of the studies they

encompass. Consequently, the reliability of the findings may be compromised by the inclusion of studies with varying levels of methodological soundness.

Another limitation arises from potential publication bias. Scoping reviews often rely on published studies, which may inadvertently exclude valuable data from grey literature or unpublished sources. These sources could provide additional insights or counterbalancing perspectives not captured in the published literature. Furthermore, if the review is restricted to studies published in English, it may miss necessary research available in other languages. This limitation can lead to an incomplete understanding of the global context of elderly food insecurity, as significant findings from non-English-speaking regions are overlooked.

The dynamic nature of research poses another challenge. As new studies on food insecurity continue to emerge, the review's findings could quickly become outdated, limiting its relevance for informing current policy or practice. Moreover, a scoping review might lack input from key stakeholders, such as elderly individuals themselves or practitioners working directly in the field. This absence of stakeholder engagement means that the review may not fully capture the lived experiences of those affected by food insecurity, nor the practical challenges faced by those working to alleviate it.

Finally, the predefined scope of a scoping review may inherently restrict its comprehensiveness. By focussing on specific aspects of food insecurity, the review might exclude relevant areas of study or emerging themes that fall outside its parameters. This scope restriction can limit the ability of the evaluation to provide a holistic view of the issue, thereby constraining its utility in informing comprehensive solutions or future research directions. Despite these limitations, a scoping review remains a crucial tool for collating and summarising the current state of knowledge, although with an awareness of its constraints.

## CONCLUSION

Enhancing food security for older people demands a concerted effort from practitioners and policymakers. By implementing culturally sensitive practices, leveraging technology and developing integrated and inclusive policies, we can address the multifaceted challenges of food insecurity amongst seniors. Moving forward, fostering collaboration across sectors and engaging older adults is essential, ensuring that interventions are both practical and empowering. Doing so can improve the health and quality of life for elderly populations and create a more equitable and food-secure future.

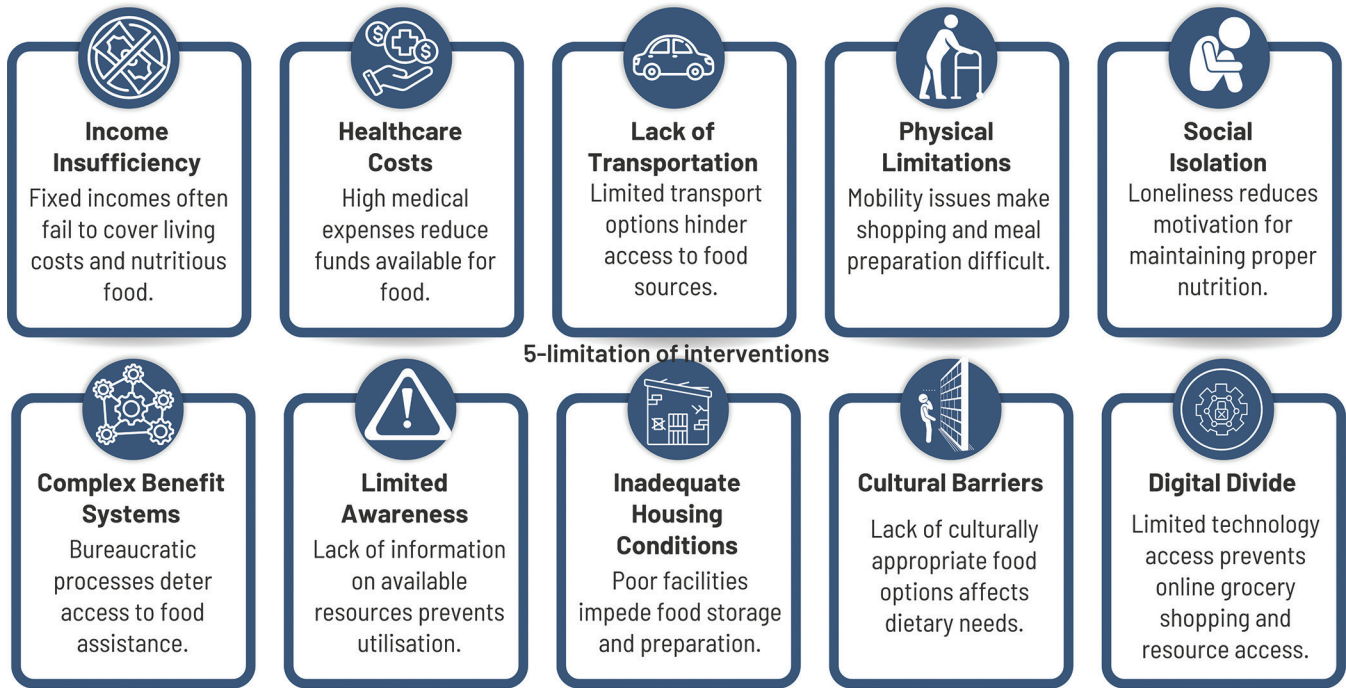
### Consent for publication

The author reviewed and approved the final version and has agreed to be accountable for all aspects of the work, including any accuracy or integrity issues.

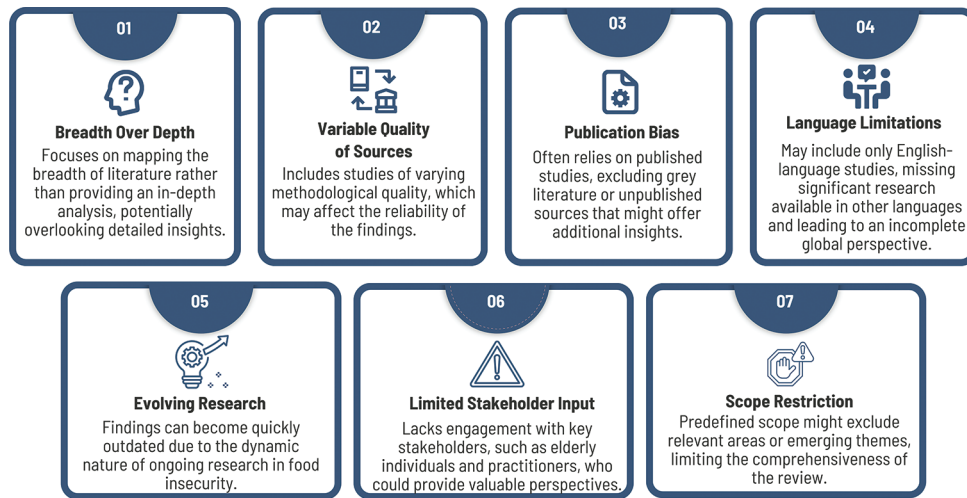
### Disclosure

The author declares that they do not have any financial involvement or affiliations with any organisation, association





**Figure 7:** Systemic barriers to food security in older people. Illustration Credit: Nor Faiza Mohd. Tohit.



**Figure 8:** Limitations of the scoping review. Illustration Credit: Nor Faiza Mohd. Tohit

or entity directly or indirectly related to the subject matter or materials presented in this review paper. This includes honoraria, expert testimony, employment, ownership of stocks or options, patents or grants received or pending royalties.

**Data availability**

Information for this review paper is taken from freely available sources.

**Authorship contribution**

All authors contributed significantly to the work, whether in the conception, design, utilisation, collection, analysis and interpretation of data or all these areas. They also participated in the paper’s drafting, revision, or critical review, gave their

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