



RESEARCH PAPER

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Factors of malnutrition in geographically isolated and disadvantaged areas: the case of the elderly

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Abstract

Geographically isolated and disadvantage areas (GIDA) frequently present elderly populations with distinctive obstacles that exacerbate the incidence of malnutrition. This study was conducted to find out the factors of malnutrition in geographically isolated and disadvantage areas: the case of the elderly in Dapitan City during the second semester of School Year 2023-2024. It utilized the descriptive survey and comparative method of research with the aid of the questionnaire checklist. There were 231 malnourished senior citizens of the six (6) barangay's namely: Hilltop, San Francisco, Aliguay, Selinog, Canlucani and Guimputlanin Dapitan City. The study revealed that most of the senior citizens belonged to the age bracket of 70 to 74 years old, most them were in high school with a family monthly income ranges from below P5,000. The senior citizens were very high on the factors of malnutrition and found out that in geographically isolated and disadvantaged areas limited access to nutritious food options due to geographic remoteness and lack of transportation infrastructure can significantly impact seniors' ability to maintain a balanced diet and depression. Further, there was no significant difference in the factors of malnutrition among the elders when analysed according to profile. Hence, targeted mental health services and social support networks should be established to address depression and provide seniors with the necessary resources and support to maintain a healthy diet and overall well-being.

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Introduction

Malnutrition is a condition that has a negative influence on older Filipinos in the country. Its harmful impact on the physical and cognitive development of elders cannot be overstated.

Similarly, malnutrition can be caused by either under nutrition or over nutrition, and it is a leading cause of sickness and death among the elderly globally. Furthermore, micronutrient shortages should account for unfavorable educational and cognitive impacts, as well as high rates of disease that may remain throughout adulthood. Selvamani and Singh (2018) asserted that a state in which there is a deficiency (undernutrition), excess (overnutrition), or imbalance of energy, protein, and other nutrients has a deleterious effect on the human body. Both undernutrition and overnutrition are associated with an increased risk of premature death, poor cognition, chronic diseases, and poor health-related quality of life. Furthermore, Lahmann *et al.* (2015) stressed out that malnutrition in older individuals arises when their diet fails to supply the necessary nutrients in enough quantities. Elderly individuals experience malnutrition as a result of physiological aging, which leads to a discrepancy between their nutritional requirements and the amount of nutrients they consume.

According to Saikia and Baruah (2015), the dietary status of older individuals influences their health independence and quality of life. Because of physiological and functional changes produced by aging, the elderly are vulnerable to malnutrition. Furthermore, elders in low-and middle-income nations have a higher risk of malnutrition due to poverty and a lack of food. In many countries, the coexistence of these two nutritional issues causes a double burden of nutrition-related poor health among the elderly (WHO, 2011).

Dapitan City, a geographically isolated and disadvantaged area and a renowned municipality in Zamboanga del Norte, was chosen as the central location to examine concerns pertaining to the

nutritional status of the elderly demographic. Among the prominent causes of malnutrition among the elderly in remote regions are the inadequacies of nutrient consumption as a result of the myriad physical and physiological changes that accompany the aging process. Numerous challenges confront the elderly, including diminished sensory perception, dental problems, and decreased appetite, which make it difficult for them to maintain a balanced diet. Social isolation among the elderly may result in diminished motivation to prepare or consume nutritious meals, ultimately contributing to inadequate dietary intake. Furthermore, a lack of financial means may impede seniors' ability to obtain high-quality food, compelling them to choose less expensive alternatives that may be less nutritious.

Imbued with the above scenario, this study was conducted to establish prompt intervention of malnutrition among elders in relevant geographically isolated and disadvantage barangay's within the peripheral areas in Dapitan City during the second semester, 2023-2024. The researchers expect to come up with valid and reliable results which would provide grounds for relevant intervention for the escalation and success of identifying the factors of malnutrition among elders.

Materials and methods

This study utilized the descriptive survey and comparative method of research with the aid of the questioner checklist. Descriptive survey and comparative method was prepared to establish the difference between the independent and dependent variables of the study.

This research method involves description, recording and analysis and interpretation of the existing data (Balase, 2001). As such, the method determined the larger perspective and range in gathering the needed information to answer the problems of this particular research.

Descriptive survey and comparative research method was prepared to establish the significant difference

between the factors of malnutrition among the elders when analysed according to profile.

Research environment

This study was conducted at six geographically isolated and disadvantaged areas urban Barangay's of Hilltop, San Francisco, Aliguay, Selinog, Canlucani and Guimputlanin Dapitan City Zamboanga del Norte. Barangays Hilltop and San Francisco (Highlands) are about 4.5 kilometers from Dapitan City. Aliguay and Selinog (Islands) are approximately 15 kilometers and 12.9 kilometers away from Dapitan City, Canlucani and Guimputlan (Coastal areas) are about 8 kilometers and 10 kilometers from the city of Dapitan. The aforementioned barangays was purported to have a population of elderly individuals who had malnutrition, a condition that significantly impacts the health, independence, and overall quality of life of senior citizens.

Studying malnutrition in a specific area is crucial due to the complex factors involved. Socioeconomic elements, like income disparities, education, and resources, directly affect access to nutritious food and lifestyle. This understanding is vital for crafting targeted interventions addressing unique challenges in malnutrition prevention based on socioeconomic groups.

Physical factors such as age-related changes, chronic illnesses, and limited mobility significantly impact nutritional status. Investigating these factors in a specific area allows tailored interventions. Additionally, psychological factors like depression and cognitive decline influence appetite and food choices, while polypharmacy affects nutrient absorption and metabolism.

Respondents of the study

The respondents of the study were the malnourished elders of the six (6) barangays namely: Hilltop, San Francisco, Aliguay, Selinog, Canlucani and Guimputlanin Dapitan City which are considered as geographically isolated and

disadvantaged areas. Complete enumeration sampling was used in the study considering a limited number of malnourished elders (Table 1).

Table 1. Distribution of the total number of respondents

Geographically isolated Barangay's	Sample respondents	Percentage (%)
Barangay Hilltop	53	22.9%
Barangay San Francisco	33	14.3%
Barangay Aliguay	22	9.5%
Barangay Selinog	30	12.10%
Barangay Canlucani	45	19.5%
Barangay Guimputlan	48	20.78%
Total	231	100%

Instruments

The research instrument of the study was derived from the study of Cordeño, Esolana, Guevara, & Laranjo (2022) titled "Assessing the Factors of Malnutrition: The Senior Citizen's Experience". The research instrument was not be subjected to validity and reliability testing because it is an adopted questionnaire. It is composed of three parts. The first part dealt with the profile of the respondent's in terms of sex, age, highest educational attainment and family monthly income. Response is indicated by marking a check [✓] in the box [] provided for after each descriptor. The second part asked on the factors of malnutrition among elderly. Using the four point likert type scale, the respondents were asked to choose the answer using the five (4) scale choices such as: 4 – very high, 3- high, 2- low, 1- very low by marking a check [✓] in the box provided after each descriptor, with the use of the numerical scale and the corresponding verbal description. The third and the last part determined the open ended questions to identify the reasons of the respondents on malnutrition that they have experienced.

Scoring procedure

To measure the extent in which respondents on the factors of malnutrition in geographically isolated and disadvantaged areas, the following numerical description and its corresponding verbal description are presented in Table 2.

Table 2. Scale

Scale	Statistical range	Verbal description	Interpretation
4	3.26 – 4.00	Very high	This implies that the elders experience this factor of malnutrition to a very great extent.
3	2.51 – 3.25	High	This implies that the elders experience this factor of malnutrition to a considerable extent.
2	1.76 – 2.50	Low	This implies that the elders experience this factor of malnutrition to a small extent.
1	1.00 – 1.75	Very low	This implies that the elders experience this factor of malnutrition to a very minimal extent.

Data gathering

With the recommendation of their research adviser, statistician and instructor, the researchers initially requested an endorsement letter from the Dean of the College of Nursing and Allied Health Sciences to gather the needed data and a certification from the research ethics committee (REC). When the endorsement from the Dean was sought and after the experts checked the instrument, the researchers then distributed the questionnaires to the respondents.

The respondents were given sufficient time to answer the questionnaires, and the researchers ensured that the data retrieved were kept safe and confidential. The data were tallied, tabulated, analyzed and interpreted.

Statistical treatment

The following statistical treatment was used in this study:

Frequency count and percentage

This was used to determine the profile of the respondents in terms of sex, age, highest educational attainment and family monthly income.

Weighted mean

This was used to determine the extent do the elders experience the factors of malnutrition in terms of socio economic factors, physical factors, psychological and cognitive factors, polypharmacy, dietary patterns and lifestyle.

Kruskal Wallis test

This was used to test the null hypothesis that there is no significant difference in the factors of

malnutrition among the elders when analysed according to age, highest educational attainment and family monthly income.

Man Whitney U test

This was used to test the null hypothesis that there is no significant difference in the factors of malnutrition among the elders when analysed according to sex.

Statistical software was used for data analysis thus posting the statistical formulas was no longer necessary. All statistical tests for this study were performed at 0.05 level of significance.

Ethical standards

A written consent was obtained from the college dean. Also, consent was given to the elders of the six geographically isolated depressed areas urban barangays to participate in the study. To ensure the respondents' safety and to identify specific respondents per barangay, the researchers are employed the coding section that is organized per barangay. During the initial interview the purpose of the study were being explained. Participants were assured that all the information was confidential and their participation in the study was voluntarily without any cost and they have the right to refuse to participate in the study. The respondents asked an approval from the Research Ethics Committee (REC) prior to the conduct of the study. All the information given by the respondents was kept confidential and 6 months thereafter the research presentation will be shred.

Results and discussion

Problem No. 1 What is the profile of the respondents in terms of:

Sex

Table 3 shows the profile of the respondents in terms of sex. It can be seen in the table that majority or one hundred thirty three (133) out of the two hundred thirty one (231) respondents are female, while ninety eight (98) are male. This means that malnutrition in geographically isolated and disadvantaged areas are dominated by women. This implies that women may face greater challenges in accessing nutritious food, healthcare facilities, and social support networks due to limited transportation options, sparse healthcare infrastructure that prioritize the needs of men over women. This finding proves the base data from Rahmanian *et al.* (2014) which revealed that majority of women are more likely to experience financial hardship, limited educational opportunities, and unstable employment, all of which can impact their ability to afford nutritious food and access healthcare services.

Table 3. Profile of the respondents in terms of sex

Sex	Frequency (f)	Percent (%)
Male	98	42.4%
Female	133	57.6%
Total	231	100%

Aflah (2016) of the United Nations Educational, Scientific and Cultural Organization (UNESCO) averred that elderly women may face unique challenges such as widowhood, disability, or caregiving responsibilities, which can further exacerbate their risk of malnutrition.

He stressed further that limited economic resources and social support networks may leave elderly women in isolated areas with few options for addressing their nutritional needs, leading to higher rates of malnutrition compared to their male counterparts. Moreover, Rawal *et al.* (2016) supported the present finding whose study revealed that women's nutritional needs vary at different life stages, such as adolescence, pregnancy, lactation, and menopause. He stated further that these stages increase the demand for essential nutrients like iron, calcium, and

folic acid. If these increased nutritional needs are not met, it can lead to deficiencies that impact the seniors potentially causing anemia, weakened immunity, and impaired development.

Age

Shown in Table 4 is the profile of the respondents in terms of age. As reflected in the table, most of the seniors living in geographically isolated and disadvantaged areas belonged to the age bracket of 70 – 74 years old having a number of 99 or 42.9% while those who were under the age bracket of 60 – 64 years old and 65 – 69 years old having the same number of 37 or 16%. However, those who were under the age bracket from 75 – 79 years old to 80 years old and above were having the same number of 29 or 12.6% respectively. This means that as individuals reach their seventies, they may experience changes in appetite, digestion, and nutrient absorption, which can impact their ability to maintain adequate nutrition. This implies that elderly individuals in this age group may be retired or nearing retirement age, leading to reduced income and financial resources to afford nutritious food and healthcare services. Empirical observations revealed that individuals in this age group may have experienced disruptions in employment or loss of income due to factors such as disability, illness, or caregiving responsibilities, which can impact their ability to meet their basic needs, including adequate nutrition.

Table 4. Profile of the respondents in terms of age

Age	Frequency (f)	Percent (%)
60 – 64 years old	37	16%
65 – 69 years old	37	16%
70 – 74 years old	99	42.9%
75 – 79 years old	29	12.6%
80 years old and above	29	12.6%
Total	231	100%

Hussin and Chang (2019) corroborated the present finding whose study unveiled that older adults may face psychological stressors such as loneliness, depression, or anxiety, which can impact appetite, food preferences, and eating patterns, further increasing their susceptibility to malnutrition. Moreover, Quinn (2010) posited that older adults in

this age group may encounter obstacles when trying to obtain preventative healthcare, guidance on nutrition, and medical intervention for chronic ailments that affect their nutritional well-being.

Highest educational attainment

Table 5 manifests the profile of the respondents in terms of highest educational attainment. As shown, the highest frequency and percentage was belonging to high school having a number of 147 or 63.6% while other seniors was belong to elementary with a lowest frequency and percentage of 84 or 36.4% were being revealed. In addition, none of the respondents were no grades completed and college and post graduate based on the data given. This means that seniors who have completed high school may be part of lower socio-economic groups, which might restrict their access to nutritional food, and healthcare services. This implies that financial constraints that make it challenging for elderly individuals to afford healthy food options and access essential healthcare services, leading to a higher risk of malnutrition.

Table 5. Profile of the respondents in terms of highest educational attainment

Highest educational attainment	Frequency (f)	Percent (%)
No grades completed	-	-
Elementary	84	36.4%
High school	147	63.6%
College and post graduate	-	-
Total	231	100%

Freijer (2013) corroborated the current findings, whose study revealed that seniors with a high school education may lack awareness and knowledge about proper nutrition and dietary practices, thereby increasing their susceptibility to malnutrition. He explains further that limited education can lead to misunderstandings or insufficient knowledge of the necessity of a balanced diet, portion sizes, nutritional requirements, and food preparation techniques, which can result in harmful eating habits and dietary decisions. Moreover, Ogunsile (2012) explored that seniors with less education may find it more difficult to comprehend dietary guidelines, read

nutrition labels, and navigate complicated healthcare systems, which increases their risk of malnutrition.

On the other hand, the absence of seniors who had no grades completed, college, or post-graduate education levels among the respondents in geographically isolated and disadvantaged areas in Dapitan City can be ascribed to multiple causes. This implies that it might be difficult for seniors living in remote and economically struggling areas to continue their education since they have less access to educational resources and institutions. Crookston (2011) stated that seniors who grew up in these places, it may be harder to go to college or get a post-graduate degree because they don't have enough money, the right facilities, or easy access to academic support services.

Family monthly income

Table 6 shows the frequency distribution of respondents in terms of their family monthly income. The findings show that there were one hundred sixty six respondents or 71.9% had family income ranges from below P5,000 and sixty five respondents or 28.1% ranges from between P5,000 and P10,000. In addition, none of the senior respondents had a family monthly income of between P10,000 and P15,000, between P15,000 and P20,000 and P20,000 and above. The table emphasizes that most of the senior respondents experiencing the scarcity of resources. This means that majority of seniors who live on a geographically isolated and disadvantaged areas don't have a stable work. Empirical observations revealed that economic strain often leads to food insecurity, where households are unable to consistently access nutritious meals, resulting in malnutrition among vulnerable populations such as the elderly.

In the latest survey of the National Statistics Coordination Board, the family should meet the required the minimum income to surpass the poverty line. On the other hand, it has been emphasized by the aforementioned agency that a sole breadwinner in a five-member family living in a highly urbanized cities in National Capital Region (NCR) is expected to experience financial difficulties if he earns only Php

350 per day and the scarcity of resources cannot be controlled due to the low income.

Table 6. Profile of the respondents in terms of family monthly income

Family monthly income	Frequency (f)	Percent (%)
Below P5,000	166	71.9%
Between P5,000 and P10,000	65	28.1%
Between P10,000 and P15,000	-	-
Between P15,000 and P20,000	-	-
P20,000 and above	-	-
Total	231	100%

However, in places which are considered as poor provinces like Zamboanga del Norte, the family income that ranges from Php 6001 – Php 9000 can be considered as having an adequate income which can able to supply their daily basic needs in the low standard way of living as compared to urban places in the country (National Statistics Office and Pantawid Pamilyang Pilipino Program 4P's, 2015).

Problem 2. To what extent do the elders experience the factors of malnutrition in terms of:

Socio economic factors

Socio-economic factors encompass the social and economic conditions that influence individuals' access to resources, opportunities, and overall well-being. Table 7 reveals that extent of elders experiences on the factors of malnutrition in terms of socio economic generally rated the indicators as "Very High" (VH). This means that seniors perceive socio-economic conditions, such as poverty, limited access to healthcare, and food insecurity, as major contributors to malnutrition among elders in the community. Empirical observation supported that insufficient monthly income signifies a substantial financial limitation, which immediately hampers the senior's capacity to afford essential needs like food and healthcare. This implies that inadequate income can lead to reduced nutritional intake, increasing the likelihood of malnutrition and worsening pre-existing health vulnerabilities. Chinyoka (2014) supported the present finding whose study divulged that the presence of financial burden can exacerbate stress levels and exacerbate the senior's general state of

well-being. Conversely, lacking readily available transportation exacerbates the challenges associated with limited income, hindering the individual's ability to access essential resources, including food and medical care.

Table 7. Extent do the elders experience the factors of malnutrition in terms of socio economic factors

Descriptors	Average weighted value	Description
1. Has too minimal monthly income.	3.80	Very high
2. Has no readily available transportation for him/her to buy food.	3.61	Very high
3. Has been living alone.	3.71	Very high
4. Has been experiencing loneliness.	3.88	Very high
Mean	3.75	Very high

Legend: 1.00 – 1.75 Very Low: 1.76 – 2.50 Low: 2.51 – 3.25 High: 3.26 – 4.00 Very High

Seniors also affirmed as "Very High" that they have been experiencing loneliness. This means that in geographically isolated areas where access to social resources and support networks may be limited; feelings of loneliness can be particularly pervasive and detrimental to the well-being of the elderly population. This implies that feelings of loneliness may lead to changes in appetite regulation, alterations in dietary patterns, and disruptions in mealtime routines, all of which can contribute to malnutrition among seniors. Crookston (2011) supported the present finding whose study divulged that loneliness may contribute to mental health issues such as depression and anxiety, which can further disrupt eating behaviors and exacerbate nutritional deficiencies. The experience of loneliness may compound existing health conditions and functional limitations, further exacerbating the risk of malnutrition among the elderly in geographically isolated areas.

Chronic loneliness has been associated with increased inflammation, elevated stress hormone levels, and compromised immune function, all of which can impact nutritional status and overall health outcomes.

Moreover, the lowest frequency and percentage for the statement "Has no readily available transportation for him/her to buy food" with a weighted mean of 3.61, very high, may be indicative of a prevalent issue within the community surveyed among seniors. This means that other ways for seniors in the neighborhood to get food readily available. There are seniors who may not have easy access to transportation, but they may still be able to get food through community food programs, home delivery services, or help from family and friends. The present finding is supported by Ogunsile (2012) whose study claims that seniors who need to get to the store may come up with creative ways to get there, like carpooling, walking, or making their shopping trips around the times they can use public transportation.

Physical factors

Physical factors relating to the elders' experience of malnutrition encompass aspects such as mobility limitations, oral health issues, chronic medical conditions, and changes in appetite or digestion. Table 8 shows the extent do the elders experience the factors of malnutrition in terms of physical factors. The table reflected that the computed weighted mean value is ranging from 3.79 to 3.36 which are described as "Very High" as experienced by the seniors. This means that seniors with physical or functional disabilities affecting eating often encounter significant challenges in accessing, preparing, and consuming meals independently. This implies further that disabilities may include conditions such as paralysis, limb impairments, or motor coordination difficulties, which can hinder their ability to manipulate utensils, handle food, or maintain proper posture while eating. The present finding is corroborated by Ogawa (2012) which states that the nutritional status and dietary intake of seniors may be negatively impacted by increased frustration, anxiety, or distress during meals if they are afflicted with these difficulties. Likewise, the "Self-Care Deficit Theory" of Orem's (2007) substantiated the current finding.

Table 8. Extent do the elders experience the factors of malnutrition in terms of physical factors

Descriptors	Average weighted value	Description
1. Has physical /functional disability affecting eating.	3.79	Very high
2. Has been dependent to others when eating.	3.48	Very high
3. Has been experiencing unintended weight loss.	3.45	Very high
4. Has been experiencing difficulty swallowing or chewing.	3.58	Very high
5. Has been experiencing difficulty swallowing or chewing.	3.58	Very high
6. Has poor visual and hearing ability.	3.45	Very high
7. Has been experiencing altered sense of smell and taste.	3.56	Very high
8. Has gastrointestinal problem.	3.44	Very high
9. Has been suffering from diabetes mellitus and kidney diseases, respiratory problems and heart problems.	3.42	Very high
10. Has been living sedentary lifestyle.	3.36	Very high
Mean	3.52	Very high

Legend: 1.00 – 1.75 Very Low: 1.76 – 2.50 Low: 2.51 – 3.25 High: 3.26 – 4.00 Very High

According to Suzana (2013), it means that the seniors may experience feelings of isolation, embarrassment, or self-consciousness related to their eating difficulties, leading to social withdrawal or avoidance of dining situations. In addition, the existence of physical impairments that impact ingestion, such as challenges with ingesting or chewing, highlights the criticality of implementing interdisciplinary approaches and establishing support networks. The present finding is also supported by Vieira and De Lira (2012), whose study found out that in the case of elderly individuals with physical disabilities that impact their ability to consume, activities like meal planning and dining out may pose significant challenges that demand ingenious approaches and accommodations. In a similar vein, seniors who struggle with swallowing or digesting may find it necessary to adjust their dietary preferences by selecting foods that are softer or more readily

digestible. This adjustment may have an adverse effect on the variety and enjoyment derived from meals.

On the other hand, the seniors “very high” on the statement indicating a sedentary lifestyle receiving a relatively lower weighted mean value and it may not be perceived as the primary factor influencing the individual's overall health and eating habits. It means that a sedentary lifestyle, characterized by prolonged sitting and low levels of physical activity, undoubtedly impacts one's health and well-being, including their dietary habits and nutritional status. Further, it implies that although sedentary behavior can lead to long-term health complications, including weight gain and diminished muscle strength, individuals may not immediately recognize the extent to which it affects their daily eating patterns compared to situations involving more tangible obstacles to food consumption. Huang (2017) stressed that individual senior who leads a sedentary lifestyle may perceive dietary concerns as less urgent in comparison to pressing health concerns, such as managing chronic conditions or experiencing difficulty ingesting. He averred further that healthcare providers and individuals may exhibit a tendency to prioritize interventions that directly target imminent health hazards or functional constraints, thereby assigning less significance to approaches that encourage a more active way of life.

Psychological and cognitive factors

Psychological and cognitive factors encompass a diverse range of mental processes and affective states that exert a significant impact on the attitudes, perceptions, and behaviors of individuals, including those that are associated with health and nutrition. Table 9 shows the extent do the elders experience the factors of malnutrition in terms of psychological and cognitive factors.

The table divulges that senior's experiences of malnutrition in geographically isolated and disadvantaged areas also obtained as “very high” extent of psychological and cognitive factors. It

showed that the neuropsychological illnesses such as Parkinson's disease, Down syndrome (DS), dementia, and depression often present cognitive impairments that can disrupt various aspects of daily living, including eating behaviors and nutritional intake. An individual's senior capacity to properly plan, prepare, and eat meals may be impacted by these conditions, which might present as challenges with motor coordination, executive function, memory recall, and mood management. The present finding is supported by Samnieng (2011) whose study claimed that particularly depression is known to be strongly associated with hunger fluctuations, which can result in changes in eating habits among seniors that may worsen nutritional intake and malnourishment in those who are affected.

Table 9. Extent do the elders experience the factors of malnutrition in terms of psychological and cognitive factors

Descriptors	Average weighted value	Description
1. Has been experiencing depressive symptoms (loss of interest in life).	3.34	Very high
2. Has neuropsychological illness (Parkinson, DSE, Dementia and Depression).	3.55	Very high
3. Has been suffering from poor memory.	3.51	Very high
4. Has been suffering from confusion (confuse about self, whereabouts, etc.)	3.38	Very high
Mean	3.44	Very high

Legend: 1.00 – 1.75 Very Low: 1.76 – 2.50 Low: 2.51 – 3.25 High: 3.26 – 4.00 Very High

Furthermore, the presence of neuropsychological illnesses may introduce additional practical challenges and barriers to maintaining a healthy diet. The overall result means that seniors were always experienced that psychological and cognitive factors play a critical role in shaping dietary habits, food choices, and nutritional intake among elders, influencing their overall nutritional status and health outcomes. Barbosa (2012) asserted that cognitive function and emotional health can change with age for many seniors. These changes can be made worse by underlying health problems, social isolation, or

major life changes like retirement or losing a loved one. Because of these things, there are many different types of nutritional risk, and it's important to make sure that treatments are tailored to the specific needs and problems that older people face when trying to eat well. Likewise, Amarya (2015) added that cognitive factors such as impaired decision-making abilities or memory deficits can compromise individuals' capacity to plan, prepare, and consume balanced meals, increasing their vulnerability to malnutrition and nutritional deficiencies. Older adults experiencing psychological distress or cognitive decline may be at heightened risk of experiencing social isolation, financial hardship, or medication side effects, all of which can further exacerbate nutritional challenges and increase susceptibility to malnutrition.

Polypharmacy

Polypharmacy implicates to the use of multiple medications simultaneously, a common occurrence among elders that significantly impacts their overall health and well-being. Shown in Table 10 is the extent do the elders experience the factors of malnutrition in terms of polypharmacy. The table discloses that seniors in geographically isolated and disadvantaged areas registered as “very high” level of polypharmacy. It means that the concurrent use of multiple medications can overwhelm the body's capacity to metabolize and eliminate drugs, leading to potential toxicity or suboptimal therapeutic outcomes. It implies that seniors may be more susceptible to the side effects of medications due to age-related changes in metabolism, organ function, and drug sensitivity, further increasing the risk of adverse outcomes associated with polypharmacy. More so, it implies that polypharmacy can have detrimental effects on older adults' nutritional status and dietary habits. Many medications commonly prescribed to older adults, such as certain antidepressants, antipsychotics, or anti-inflammatory drugs, can have side effects that affect appetite, digestion, or nutrient absorption.

The present finding is supported by Torheim (2010) which showed that the complexity of managing

multiple medications may result in medication non-adherence or irregular dosing schedules, further exacerbating the risk of malnutrition among older adults. She averred further that the cumulative impact of these factors can contribute to nutritional deficiencies and compromised health outcomes among individuals experiencing polypharmacy. Regular monitoring of medication regimens, including routine medication reviews and assessments of medication adherence and effectiveness, helps ensure that older adults receive optimal pharmacotherapy while minimizing the risk of polypharmacy-related complications.

Table 10. Extent do the elders experience the factors of malnutrition in terms of polypharmacy

Descriptors	Average weighted value	Description
1. Has been simultaneously using multiple medications.	3.57	Very high
Mean	3.57	Very high

Legend: 1.00 – 1.75 Very Low: 1.76 – 2.50 Low: 2.51 – 3.25 High: 3.26 – 4.00 Very High

Dietary pattern

Dietary pattern pertains to the overall composition and combination of foods consumed by an individual or population over time, reflecting their habitual dietary choices and eating behaviors. Table 11 presents the extent do the experience on the factors of malnutrition in terms of dietary pattern. As seen in the table, senior's experiences on the factors of malnutrition in geographically isolated and disadvantaged areas in Dapitan City rated themselves as “very high” in their dietary pattern. It means that nutritional deficiencies, imbalances, and associated health complications among seniors including malnutrition, compromised immune function, and an elevated susceptibility to chronic diseases such as obesity, diabetes, and cardiovascular disease, may result from an unbalanced diet. It implies that consuming too much food, especially energy-dense and nutrient-poor foods high in added sugars, unhealthy fats, and sodium, can lead to excessive calorie intake and weight gain. It implies further that overeating may also contribute to digestive issues,

metabolic disturbances, and increased risk of obesity-related conditions, such as hypertension, dyslipidemia, and insulin resistance, thereby exacerbating the risk of chronic disease development among seniors and compromising overall health outcomes.

Table 11. Extent do the elders experience the factors of malnutrition in terms of dietary pattern

Descriptors	Average weighted value	Description
1. Has decreased food intake due to lack of food supply.	3.48	Very high
2. Has been experiencing poor/loss appetite.	3.32	Very high
3. Has been eating unbalanced diet.	3.57	Very high
4. Too much consumption of food.	3.65	Very high
Mean	3.50	Very high

Legend: 1.00 – 1.75 Very Low: 1.76 – 2.50 Low: 2.51 – 3.25 High: 3.26 – 4.00 Very High

Unarguably, the co-occurrence of consuming an unbalanced diet and excessive food intake underscores the complexity of dietary behaviors and their interconnectedness. Seniors who consume an unbalanced diet may be more prone to overeating as they may not feel satisfied or adequately nourished by their food choices, leading to compensatory overconsumption of calories in an attempt to meet their nutritional needs. Kahana (2011) supported the present finding whose study revealed that environmental and socio-cultural factors, such as food availability, marketing, social norms, and economic constraints, may influence individuals' dietary behaviors, contributing to both unbalanced dietary patterns and excessive food intake. He explains further that the recognition among seniors of the adverse consequences of food insecurity, where individuals may face limited access to an adequate and nutritious food supply.

Lifestyle

Lifestyle encompasses the various habits, behaviors, and choices individuals make in their daily lives, including diet, physical activity; sleep patterns, stress management, and substance use. As reflected in the

table, the table revealed that all the seniors garnered as “very high” on their lifestyle of malnutrition. It means that disruptions in appetite and satiety signals caused by irregular meal times or meal skipping may result in erratic eating habits, subsequent overeating, or insufficient consumption of essential nutrients. It implies that adverse effects of alcohol consumption include heightened caloric intake, compromised discernment, and modified food selections, which can result in unfavorable dietary patterns and compromised nutritional health (Table 12).

Table 12. Extent do the elders experience the factors of malnutrition in terms of lifestyle

Descriptors	Average weighted value	Description
1. Has been smoking consistently.	3.66	Very high
2. Has irregular meal time or used to skip meals.	3.81	Very high
3. Has been drinking alcoholic beverages.	3.81	Very high
4. Has been using recreational drugs.	3.81	Very high
Mean	3.77	Very high

Legend: 1.00 – 1.75 Very Low: 1.76 – 2.50 Low: 2.51 – 3.25 High: 3.26 – 4.00 Very High

Moreover, persistent alcohol misuse can disrupt the process of nutrient metabolism and absorption, thereby heightening the susceptibility to nutritional deficiencies and associated health complications. The present finding is supported by Tsai (2020) whose study divulged that alcohol consumption may be correlated with lifestyle choices, including socializing in settings where unhealthy food options are easily accessible or adopting irregular eating habits as a result of mood or behavioral changes induced by drugs.

Conversely, Irregular meal times or skipping meals may coincide with periods of increased alcohol or drug consumption, as individuals may prioritize substance use over maintaining regular eating routines. Alcohol consumption and recreational drug use can disrupt individuals' appetite regulation and dietary patterns, leading to erratic eating behaviors and poor food choices.

Table 13. Test of significant difference in the factors of malnutrition among the elders when analysed according to profile

Profile	Elderly experiences on the factors of malnutrition			
	H-value	U-value	p-value @ 0.05*	Interpretation
Age	5.902	-	0.207	Not Significant
Sex	-	5987.00	0.285	Not Significant
Highest educational attainment	2.266	-	0.132	Not Significant
Family monthly income	-	5144.50	0.578	Not Significant

*p-value < 0.05 level of significance = significant; Reject Ho

*p-value > 0.05 level of significance = not significant; Fail to Reject Ho

Problem 3. Is there a significant difference in the factors of malnutrition among the elders when analysed according to profile?

Table 13 shows the test of difference in the factors of malnutrition among the elders when analysed according to profile. On the table, the following profile; age, sex, highest educational attainment, and family monthly income was treated and analyzed with the aid of Kruskal Wallis H test while Mann-Whitney U Test was utilized on sex variable. These are the appropriate statistical tools for the reason that the data obtained are ordinal scale or level of measurement.

The findings of the study show that all of the profile being analyzed had a p-value greater than the level of significance alpha at 0.05 which leads to the acceptance of the null hypothesis.

Therefore, there is no significant difference on the factors of malnutrition among the elders when analysed according to profile. Thus, the data did not provide sufficient evidence to conclude that the seniors' profile may significantly vary along factors of malnutrition indicators included in the study. This means that whether the seniors is old, male or female, without or finished studies and had enough income or low income does not reflect any statistical variation on the factors of malnutrition as experience by seniors' respondent. This implies that senior individuals may face unique challenges related to changes in metabolism, appetite regulation, and physical health regardless of their age, sex, highest educational attainment and family monthly income which can impact their nutritional intake and overall well-being. The present finding supported by the

study of Ferdous (2020) whose study did not show a statistically significant difference in the factors of malnutrition among the elders as to age, sex, highest educational attainment and family monthly income because social and economic conditions greatly affect an older person's choices of diet and even eating patterns, which can lead to poor nutrition. However, according to some data, requirements for other essential nutrients may, in fact, increase as age increases. Lifestyle and daily activities of elderly people also affect their nutritional status (Han *et al.*, 2009).

Open-ended questions

1. How was your appetite 10 years ago? Describe changes

The following themes were formulated on the factors of malnutrition among seniors:

(1) Social engagement; (2) decline in appetite over time.

Social engagement and decline in appetite over time

Ten years ago, seniors enjoyed a robust appetite, closely tied to their social engagement and active lifestyles. Regular social interactions and communal meals created a positive environment that encouraged consistent eating habits and enjoyment of food. These social activities provided not only emotional support but also practical assistance in meal preparation and consumption. The combination of social engagement and physical activity helped maintain a strong appetite and good nutritional status.

However, the respondents' current experiences reflect a significant decline in appetite and social engagement. Many seniors find it difficult to chew food and lack the desire to eat, which can be

attributed to health issues and decreased physical ability. This was evident when respondents remarked: *"Maglisod na og usap sa pagkaon og wala nay gana mo kaon."* (It's now difficult to chew food, and there's no longer any appetite for eating.)

"Wala nay ikapalit og pagkaon kay maglisod nag trabaho." (There's no money to buy food because it's hard to work.)

"Dili na maka lakaw-lakaw." (I can't walk around anymore.)

Findings imply that there were physical discomfort and health problems contribute to a reduced appetite. Additionally, the isolation and absence of social interactions have removed the positive reinforcement that once came from communal meals, further diminishing their interest in food. Economic challenges also play a crucial role in the decline of appetite and social engagement. This lack of income limits their ability to purchase nutritious food, leading to a reliance on cheaper, less healthy options. The inability to walk around exacerbates this issue by making it difficult to access grocery stores or community resources. These interconnected factors create a cycle where poor physical health, social isolation, and economic hardship all contribute to malnutrition among seniors in geographically isolated and depressed areas.

Social Cognitive Theory (SCT) by Bandura, as cited by Afulani *et al.* (2015), suggests that the importance of social interactions and the environment in shaping behavior, including eating habits. In addition, senior's social engagement through communal meals and regular social interactions can positively reinforce healthy eating behaviors. When seniors observe others enjoying food and participating in meal times, it can enhance their own appetite and motivation to eat. The support and encouragement from peers and family members during meals further promote consistent and robust eating habits.

In support to this Hierarchy of Needs Theory by Maslow (1943) posits that when seniors participate in social

activities and communal dining, they experience a sense of connection and belonging. This emotional satisfaction can enhance their overall well-being and stimulate their appetite. The feeling of being valued and connected within a community can drive seniors to maintain regular eating patterns, contributing to a robust appetite.

2. What would you usually eat in a typical day?

Theme was formulated on the factors of malnutrition among seniors: (1) balanced and varied diet in the past.

Balanced and varied diet in the past

Respondents believed that consumed a balanced and varied diet that included cooked food, fish, eggs, and vegetables. This variety ensured they received a range of essential nutrients necessary for maintaining good health. Fish provided high-quality protein and essential fatty acids, eggs offered proteins and important vitamins like B12, and vegetables were rich in vitamins, minerals, and fiber. This balanced diet supported their physical health, contributing to stronger immune systems, better energy levels, and overall well-being. Respondents stress out:

"Kasagaran akong mga pagkaon kay luto, isda, itlog og utan." (Most of my meals are cooked food, fish, eggs, and vegetables.)

The results of the study indicate that the majority of the senior's preparation and consumption of these foods also indicate a higher level of social and physical engagement in the past. Cooking food and preparing meals require a certain level of physical activity and coordination, suggesting that respondents were more active and engaged in daily life. Additionally, the social aspect of meal preparation and dining cannot be overlooked. Often, meals are shared with family and friends, creating a sense of community and belonging. This social interaction not only made meal times enjoyable but also motivated seniors to maintain a regular and nutritious eating schedule.

The decline in physical ability, financial constraints, and social isolation has led to simpler and less nutritious meals. The loss of access to fresh fish, eggs, and vegetables has resulted in a

diet that lacks the variety and balance previously enjoyed. This change has likely contributed to the deterioration in their health, illustrating the importance of maintaining a varied and balanced diet for seniors, especially those in geographically isolated and economically depressed areas. The present finding was supported by Chalerm Sri *et al.* (2020) whose study revealed that as seniors decreased mobility, limited access to fresh produce, and financial constraints, their ability to maintain such a balanced diet diminishes. This shift can lead to a reliance on less nutritious, cheaper food options, resulting in an inadequate intake of essential nutrients. The transition from a varied diet of cooked meals, fish, eggs, and vegetables to more monotonous and less nutritious eating patterns exacerbates the risk of malnutrition among seniors.

Conclusion

In geographically isolated and disadvantaged areas, elderly populations often face unique challenges that contribute to the prevalence of malnutrition. The study concluded that most of the seniors belonged to the age bracket of 70 to 74 years old, were most of them are high school with a family monthly income that ranges from below P5,000. Socioeconomic factors, such as income level and access to resources, were very high upon as significant contributors to malnutrition, indicating widespread recognition of the impact of socioeconomic disparities on nutritional status among seniors.

Similarly, physical factors, including health conditions and functional limitations, were also very high upon, highlighting the importance of addressing physical health concerns in efforts to combat malnutrition among the elderly. Moreover, psychological and cognitive factors emerged as significant contributors to malnutrition, emphasizing the need to consider mental health and cognitive well-being in interventions aimed at improving nutritional outcomes for seniors.

Polypharmacy, dietary patterns, and lifestyle factors were also strongly associated with malnutrition, underscoring the multifaceted nature of this issue and the importance of addressing diverse aspects of seniors' lives to promote optimal nutrition. Also, there was no significant difference on the factors of malnutrition among the elders when analysed according to profile.

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