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PHYSICAL AND CLINICAL STATUS AND FOOD CONSUMPTION PATTERNS OF THE ELDERLY IN GHANA: EVIDENCE FROM KWAHU SOUTH DISTRICT

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ABSTRACT: *Caring for the elderly is a requirement for development. Ghana's unpreparedness to meet the nutritional need of the steadily growing elderly population made this study delve into the food habits of the elderly. This study focused on the physiological status and food habits of the elderly in the Kwahu- South District of Ghana using the sequential explanatory mixed-method design. The study first exposes the reader to theoretical and empirical surveys pertinent to the topic from a global perspective focusing on Ghana. With the aid of a questionnaire and a focus group discussion guide, the researchers solicited data from 103 respondents, 97 for the quantitative and 6 for the qualitative phase, respectively, who were sampled using simple random sampling and purposive sampling techniques. Data collected were analysed using frequency counts and percentages with version 20 of the SPSS for the quantitative aspect, whereas emerging themes were used for the qualitative data. Findings of this study established that difficulty in chewing a\nd swallowing, immobility, gastrointestinal challenges and diminished sensory abilities such as reduced taste and poor eyesight were identified as the physiological characteristics of the elderly. Food taste, texture, and smell are the major organoleptic factors influencing the food choice of the elderly in the study area. Again, psycho-socioeconomic factors like emotions elicited on seeing given foods, perceptions one develops seeing one eating particular foods, cost, and availability of foods emerged as broad determinants of adults' food habits in this study. The study also found out that foods such as game, fish, egg, plantain, potatoes, fruits, and vegetables ranked high on the list of likes of the elderly over the study period. This study, therefore, recommends that dieticians formulate a standardised dietary plan that considers the physiological characteristics of the elderly to enjoy their meals.*

KEYWORDS*:* Physical Characteristics, Food Habits, Kwahu South, Family System, Aged

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INTRODUCTION

The inevitable nature of human processes has accounted for the rapid increase in the ageing population worldwide in recent times. Indeed, with the relevance of good nutrition in maintaining health among all individuals, especially as individuals age, the food habits of the elderly have become very prominent in the academic discourse (Amarya, Singh & Sabharwal, 2015). This is because breakthroughs in medicine, reduction in wars, and improvement in diet and general living conditions have improved life expectancy, and thus, the sheer number of the elderly has increased globally (McPhee, Rabinow & Papadaki, 2019; Yamamoto, Motokawa, Yoshizaki, Yano, et al, (2020).

Ageing has been documented as a natural part of life that is necessary, integral, and physiological (Partridge, Gems & Charlesworth, 2002). The ageing process is a gradual stage which occurs throughout a person's lifespan. This process begins with early adulthood, and as time passes, many mental and physical capacities steadily decline (Flatt & Partridge, 2018). According to current projections, 2 billion older people will be alive by 2050, meaning their number will have tripled over the previous 50 years due to declining fertility rates and rising life expectancy. The population aged 60 or over has increased by threefold since 1950, reaching 600 million in 2000, and by 2006, it had surpassed 700 million (UNWPP, 2007).

In increasing longevity in old age, there is the need to improve the quality of life, which is achievable by ensuring a well-balanced diet and proper nutrition in the prevention and management of chronic conditions (Campbell, 1997; Reber, Strahm, Bally, Schuetz, & Stanga, 2019). Maintaining good nutrition in life has been undoubtedly evidenced to be linked with good health, perhaps, this is very particular in the case of the elderly because inadequate nutritional intake has a substantial impact on both chronic and acute morbidity, with illnesses having an impact on food consumption, which further erodes the body's ability to resist disease (Campbell, 1997; Reber, Strahm, Bally, Schuetz, & Stanga, 2019). The elderly have been defined by Amarya et al. (2018) as those who are 60 years of age or older and make up the fastest-growing population segment in the globe. Besides, as people age, they gradually develop physical impairment and functional limitations, which leads to increased dependency (Amarya et al., 2018). This stage of life of the elderly makes it imperative to focus on their food habits. Food habit has been elaborated by Preedy and Watson (2010) as the reasons why people eat and how they eat, which foods they eat, and with whom they eat, as well as the ways people obtain, select, store, use and discard food. In essence, maintaining good health is mostly dependent on eating a balanced, nutrient-dense diet, especially as people get older.

Numerous studies have assessed the potential benefits of dietary interventions in postponing the development of age-related disorders and in reversing the progression of specific conditions (Dangour, et al., 2010; Moreira, Jansen & Silva, 2020). Besides, special attention to nutrition has been considered to be crucial as individuals age because it has a significant impact on the quality of life in terms of physical, mental and social health (Kaur, Rasane, Singh, Kaur, Kumar, Mahato, Dey, Dhawan & Kumar, 2019). This is evident in the study by Melzer, Manosso, Yau, Gil-Mohapel and Brocardo (2021), who revealed that eating a diet high in antioxidants and anti-inflammatory substances like those in fruits, nuts, vegetables, and seafood may lessen the chance of acquiring numerous neurodegenerative disorders as well as age-related cognitive decline.

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Consistently, scholars, Scarmeas, Stern, Mayeux, Manly, Schupf, and Luchsinger (2009) and Van de Rest, Berendsen, Haveman-Nies, de Groot (2015) posit that the symptoms of certain chronic conditions in the elderly population have been revealed to be slowed down by certain diets and therefore the long-term intake of diets rich in fruits, vegetables, and olive oil correlates with older populations' improved cognition thereby creating a positive link between diet and wellbeing of the aged. Again, Grimm, Michaelson, & Hartmann (2017), found in their study that through modifications in biochemical and epigenetic factors, nutrition may be able to alter the onset of various neurodegenerative diseases such as Parkinson's disease (PD), Alzheimer's disease (AD), and other types of dementia in the elderly. The preceding claims have demonstrated that optimum nutrition during old age is critical and should be at the forefront in discussing issues pertinent to ageing.

Meanwhile, studies have identified a decline in the food habits of the elderly as a result of the multifaceted process of aging, which is characterised by several physicals, social, and physiological changes that take place in individuals as they age, making research on the elderly nutrition an essential field of study (Kaur, Rasane, Singh, Kaur, Kumar, Mahato, Dey, Dhawan & Kumar, 2019). It has been documented that lifestyle changes due to modernisation, urbanisation, migration and advances in technology have reaffirmed the need to carefully consider the food habits of the elderly (Mba, 2010; WHO, 2015; Smith, Sim, Scharf, & Phillipson, 2004; Van Hoof, Kazak, Perek-Białas, & Peek, 2018; Leeson, 2018). Besides, the eating habits of individuals change as they age due to physiological, psychological, and social changes, except for a healthy eating pattern being observed to protect against some age-related pathologies like dementia etc. (Fostinelli, De Amicis, Leone, Giustizieri, Binetti, Bertoli, Battezzati & Cappa, 2020). Studies by Yannakoulia, Mamalaki, Anastasiou, Mourtzi, Lambrinoudaki and Scarmeas (2018) have identified the elderly population to be the most nutritionally susceptible group, due to the interaction of certain interrelated factors such as personal, social, cultural, environmental and economical, leading to a condition known as "nutritional frailty". For instance, poverty makes it difficult for them to afford to meet their nutritional demands. Loneliness and social isolation lead to less food preparation and, as a result, less food consumption. According to Locher, Ritchie, Roth, Baker, Bodner, and Allman (2005), this can cause chronic depression, making a person more vulnerable to malnutrition (Luppa, König, Heider, Leicht, Motzek, et al., 2013).

In affirmation of these notions, previous studies have shown several changes in the elderly that influence their food habits, such as changes in the musculoskeletal system, body composition changes etc., with physiological characteristics being highlighted to have major implications on the food habits of the elderly (Amarya, Singh & Sabharwal, 2018). Consistent with this claim, studies by McKhann, et al. (2011), identified neurological problems as a major physiological change associated with ageing thus changes in the nervous system where the brain's ability to interact and transmit impulses declines with age. Additionally, these authors again emphasised that the main worry for elderly people is losing their mental capacity, which includes losing their own identities due to dementia (often Alzheimer's disease). With age, it is also more typical to experience a stroke or several other neurological disorders, such as Parkinson's disease, which may influence food consumption patterns since diet can affect the brain's ability to combat illness (Gomez-Pinilla, 2008). Evident to the above claims, the World Health Organization (2014), have shown that Alzheimer's-type dementia affects roughly 5% of men and 6% of women globally who are 60 years of age or older.

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Accordingly, a study by Barichella, Akpalu, Cham, Privitera, Cassani, Cereda, Iorio, Cilia, Bonetti, and Pezzoli (2013) assessed the nutritional status, dietary habits, and the prevalence of nutritional complications of the elderly in Ghana and found out that the typical diet of the elderly was generally based on semisolid foods often vegetable soups accompanied by cereal flour or root starch or sometimes chicken or fish due to the physiological challenges observed during old age. It was again discovered that the intake of milk and its derivatives were low among the elderly, with constipation and dysphagia also been prevalent among them. Furthermore, Furhda (2009) in his study on nutrient intakes and food preferences of persons aged 60 and above via a cross-sectional survey in Malaysia, revealed a higher preference for vegetables, fruits, and beans than red meat, milk, and dairy products. Consistent with the above claims, Karim, and Mydenkather (2003); Norimah and Mohaideen, (2003); Ahmed and Siwar (2013) study on food habits of the elderly affirmed that rice, fish, and vegetables were the foods consumed in almost every day by the majority of the elderly, whereas meat, dairy products, and fruits were eaten relatively rare in the diets as a result of some physiological conditions experienced. It can be deduced from the above claims that the onset of physiological changes does influence the food consumption level of the elderly.

Healthy diets have been shown to activate chemical mechanisms that support neuronal function and plasticity in the brain and spinal cord. These diets should be rich in omega-3 fatty acids and calcium, found in foods like salmon and plant turmeric respectively. Again, older people tend to avoid animal proteins despite having higher protein needs to respond to ageing-related anabolic stimuli, possibly due to chewing and swallowing issues or worries about the animal protein's high cholesterol and saturated fat content (Yannakoulia, Mamalaki, Anastasiou, Mourtzi, Lambrinoudaki & Scarmeas, 2018). A study by Murman, (2015) has consistently identified that older adults frequently experience declines and impairments in cognitive function. These modifications typically result from distal or proximal life events, where distal events are early life encounters like cultural, physical, and social circumstances that affect functioning and cognitive development. Similarly, a study by Ozawa, Miyazawa and Miyazawa (2021) has drawn a link between physiological changes in the elderly and its relation to food, as it was revealed that food containing bioactive substances and good dietary patterns are related to improved age-related cognitive decline. Ozawa, et al, (2021).

Likewise, Amarya, Singh and Sabharwal (2015) revealed the decline in the absorption of certain nutrients due to physiological changes during ageing. They emphasised that, throughout the digestive tract, various additional modifications occur, thus gastric acid output declines, which may restrict the absorption of iron and vitamin B12. Again, reduced salivation during old age causes delayed peristalsis and constipation. These authors again discovered that during old age there is a dysregulation of hunger and thirst, which alters the impact of hunger influencing the food habits of the elderly. Besides, the modifications of eating behaviours and decreased nutrient availability and absorption, nutritional deficiencies and other health issues may result due to loss of vision, a physiological change experience during old age making eating and cooking more challenging to the elderly and the decline in taste and smell buds make food less enticing during this stage (Amarya, 2015).

Having realised the influence of physiological changes on the food habits of the elderly, Kaur, Rasane, Singh, Kaur, Kumar, Mahato, Dey, Dhawan and Kumar (2019) posits that the ability to consume enough food declines with age due to loss of appetite, a physiological condition at old age, making it difficult for the elderly to consume enough food to meet their recommended

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nutrient needs, thereby, influencing their food habits. With similar claims, Sanford's (2017) report revealed that the decline in the quality and amount of the food consumed by the elderly is due to the diminished sensation of taste caused by a reduction in the quantity and sensitivity of papillae, taste buds, or the density of taste buds on the tongue which is as a result of the decrease in sensory ability and poor oral health. A study by Visvanathan (2015) confirmed these claims when it was revealed that more than 60% of the elderly population between the ages of 65-80 years and 80% of those over 80 years experienced a reduced sense of taste.

Furthermore, dry mouth and chewing problems experienced during old age have been documented to alter food intake. They are associated with poor nutritional status, resulting from ill-fitting dentures and poor dentition (Landi, Calvani, Tosato, Anna, Elena & Giulia, 2016).

Based on the claims mentioned above, it is worth postulating by several scholars that physiological status influences food consumption patterns of the elderly which has an impact on their growth and development and thus maintenance of the physiological processes of ageing (Bargiota, Delizona, Tsitouras & Koukouli, 2013; Gu, Sable, Brooks-Wilson, Murphy, 2020). In this regard, it is expected that much credence is entrenched towards elderly nutrition and a particular focus on the food consumption pattern practised in the later years of life since they have a role to play in their health and wellbeing; therefore, its worth to be researched.

Life expectancy has increased over time, such that 8% of the world's population is over 65 years old, and this percentage is predicted to quadruple in about 30 years (United Nations, Department of Economic and Social Affairs, 2019). Consistently, the World Health Organization (2014) has emphasised a growth increase in the ageing population which has been estimated as 2 billion people reaching the age of 60years and over and 400 million to be aged 80 years and over by the year 2050, considering the Low-Middle income countries accounting for 80% of which Ghana is no exception. Despite the rise in life expectancy, aging is a mechanism with complex aspects related at the molecular, cellular, physiological, and functional levels that ultimately result in chronic diseases (Marsman et al., 2018).

Notwithstanding, the alarming rate of cases of non-communicable diseases among the elderly population has been well documented and traced to some mechanisms occurring during the ageing process, with physiological changes accounting for a more significant proportion of the raised cases (Bruins, Van Dael, & Eggersdorfer, 2019; Ayernor, 2012) perhaps, if not accounted for, may lead to increased morbidity among the aged. This affords the need for studies delving into the food consumption pattern of the elderly.

However, a survey report has revealed Kwahu South District to have an increased number of the elderly population ranging between 60-80 years as compared to other districts and perhaps have traced the elderly to the engagement of farming and fishery work where accessibility to food commodities are high (GSS10). Again, records gained from the Kwahu South Government Hospital, Atibie identified complaints and conditions reported by most elderly in the ……..book were relative to specific conditions of ageing. The concern now is that with the array of food commodities available to the elderly, are they the main beneficiaries of its consumption? This study is, therefore, conducted to gather empirical evidence to address this concern.

This paper seeks to establish the physiological status and food consumption pattern of the elderly in the Kwahu South District of Ghana with the following research questions set to guide

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the study; 1) what are the physiological characteristics of the elderly in the Kwahu South District of Ghana? and 2) what are the food consumption patterns of the elderly in the Kwahu South District of Ghana?

The study hopes to make significant contributions to the study of geriatrics and gerontology, especially in the areas of feeding. It will expose the readers to the specific physical and clinical characteristics of the elderly that prohibit the consumption of certain food, which is likely to have a negative effect on their dietary and nutritional requirements. This will inform families, caregivers and service providers

METHODOLOGY

This study employed a sequential explanatory mixed method design in line with the pragmatist paradigm. This study was well grounded in this paradigm based on Cooper & Schindler's (2008) and Malhotra's (2004) assertion that pragmatism allows the researcher to understand the topic within the explorative, descriptive and casual frameworks suitable in terms of the focus of this study. The mixed-method approach was employed because it offered in-depth insight into respondents' behaviour (Bryman, 2015). It also permitted research questions that call for real-life contextual understandings, multilevel perspectives, and cultural influences on the topic of interest (Bordens & Abbott, 2014).

The multistage sampling strategy was used in this study to choose respondents. According to Bryman (2015), the multistage sampling approach is cost-effective, time-effective, adaptable, aids in sample selection, and is excellent for gathering primary data from a geographically scattered population. The Kwahu-South District was divided into five (5) clusters based on the spread of the target population at the first stage. Using a simple random sampling technique, the researchers selected a group where 100 respondents were purposively selected as representatives in the study. This was adequate to produce robust estimates because Tabachnick & Fidell (2019) had prescribed a minimum sample of 50 for computing robust estimates adequately. Potential respondents were first asked a few demographic questions to gauge their understanding of issues and whether they were willing to complete a set of questionnaires on the topic. Correct answers to the few posed demographic questions qualified one to participate in the study.

Data was solicited using a structured questionnaire, focus group discussion guide and an observation checklist. The questionnaire was chosen for this study because it guaranteed respondents confidentiality and anonymity, allowing them to freely express their views without fear (Kaiser, 2009). Again, it is an efficient way to collect statistically quantifiable information (Murdoch, Simon, Polusny, Bangerter, Grill, Noorbaloochi, & Partin, 2014). The questionnaire using a 5-point consisted of three sections, with section one capturing the respondents' bio-data, the second section consisting of items on the physiological characteristics, and the third section obtaining data on the food consumption patterns of the respondents.

The researchers administered the questionnaires to 100 selected elderly in their homes with the assistance of two trained research assistants who helped interpret the items on the questionnaire to the respondents in a local dialect (in the case of those who could not read due to poor vision or illiteracy). Finally, six (6) experts on the issues of the elderly were purposively selected for

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a focus group discussion (FGD) for the qualitative phase of the study based on the recommendation by Moser and Korstjens (2018). Regarding the qualitative aspect of the survey, knowledgeable individuals on the issues of the elderly were used in an FGD. Nyumba, Wilson, Derrick, and Mukherjee (2018) argue that focus group discussion helps to explain results obtained from the questionnaire, capture general beliefs and experiences that influence those results and explore narrative aspects of a topic (Schmidt, 2015). Using knowledgeable individuals was considered more reliable in standardising information from group perspectives. The group included four (4) females and two (2) mas. The FGD began with the participant signing in and the moderator providing a short orientation on how discussions were conducted. The session was both audiotaped and transcribed with the help of research assistants. Participants were asked questions to gain insight into their physiological status and food consumption patterns. Finally, during discussions, the moderator probed the participants with questions for clarification on issues to ensure an in-depth articulation of views. The moderator directed the conversation to the less vociferous members of the group in an attempt to span a diversity of experiences and opinions. Although this was not always successful with less forthcoming participants, it averted an over-representation of the views of small numbers of more vocal members. Each discussion on the topic lasted approximately 20-30 minutes.

Meanwhile, the physical characteristics were observed using an observational checklist as stated by Anguera, Portell, Chacón-Moscoso, and Sanduvete-Chaves, (2018) that using observation in research provides information on other details that, in reality, people may be unwilling to disclose. The quantitative data were analysed using descriptive statistics such as frequency counts and percentages and presented using a pie chart and tables with version 22 of the Statistical Product for Service Solution. At the same time, the qualitative data were presented in the form of narratives to tell the story from the participants' perspectives captioned under themes after the transcription of the data. Issues from the field were synthesised and put in a logical narrative to give participants' views. Responses from respondents were recorded and put together in a way that allowed comparisons and deviations from the literature reviewed.

RESULTS AND DISCUSSION

A response rate of 97 was realised, constituting 97 %. This response rate was deemed adequate based on the recommendation by Fincham (2008). The study results are presented under demographic and based on the research questions set to guide the study using appropriate tables and graphs.

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Respondents by Gender

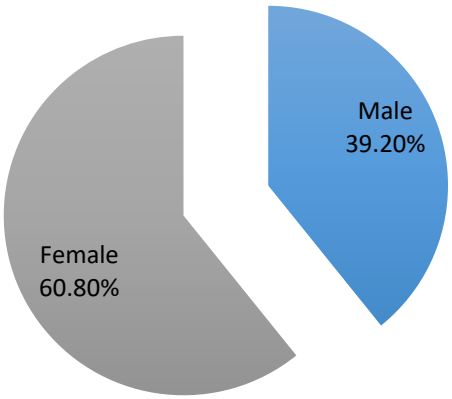

Fig 1: Gender Distribution of the Respondent

Fig. 4.1 shows that out of the valid 97 respondents who answered the question on gender, 59 (60.8%) were female, whereas 38 (39.2%) were males. This finding reaffirmed that life expectancy for the Ghanaian adult female population is generally higher than their male counterpart (GSS, 2014). A further explanation for this observed tendency was that more females in the Kwahu-South District throughout the research period were probably going to age gracefully than their male counterparts. The GSS (2010) population and housing report supported this by demonstrating that there were more women than men in the older age groups.

Table 4.1: Educational and Employment Status of Respondents

Demographic variable		Frequency	Percentage %
Educational status	Primary	15	15.5
	MSLC	18	18.6
	Post-sec	13	13.7
	Vocational/technical	03	03.1
	O/A level	36	37.1
	Tertiary	03	03.1
	No Formal Education	01	01.1
	Total	**97**	**100**
Marital status	Married	17	17.5
	Divorced	32	33.0
	Never married	08	08.3
	Widowed	37	38.1
	Others (cohabitation)	03	03.1
	Total	**97**	**100**

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Table **4.1** shows the educational background and marital status of the respondents. It was revealed that 36(**37.2%**) of the respondents were O/A level holders, with 18(**18.6%) having Middle School Leaving certificates, 15(15.5%)** completed primary education, and 13(**13.7%)** having finished post-secondary education, respectively with the minority 3(**3.1%**) having vocational/technical and tertiary education respectively and 1(1.1) with no education.

Again, from the table above, a more significant number of the respondents, 37(38.1), indicated being widows, whereas 32(33.0%) of the respondents divorced, 17(17.5%) married 8(8.3) were not married at all with 3(3.1) having informal/consensual unions.

Research Question 1: What are the physiological characteristics of the elderly in the Kwahu South District of Ghana?

This research question examined the physiological conditions experienced by the elderly. *The conditions were rated on a scale of 1-5, with 1 as never experiencing the age-related condition and 5 as constantly experiencing those conditions that affect their food consumption patterns, respectively. Weighted scores were obtained by finding the product of the ratings and frequencies for each condition.*

*E.g. 51 respondents reported always having constipation. (51*5=255).*

The results of the analysis are presented in Table 1.

		Attitudes					
Conditions that affect the elderly		Never	Rarely	Sometime	Often	Alway	Total
	Weights	1	2	3	4	5	
Constipation	Frequency	3	7	17	19	51	97
	Weighted Scores	3	14	51	76	255	399
	Percent	0.75	3.5	12.8	19.0	63.9	100.
Difficulty in chewing and swallowing	Frequency	0	0	0	97	0	97
	Weighted Scores	0	0	0	388	0	388
	Percent	0	0	0	100	0	100.
Diarrhoea after eating	Frequency	10	13	69	2	3	97
	Weighted Scores	10	26	207	8	15	266
	Percentage	3.75	7.77	77.82	3.01	5.64	100.
Addition of Salt, Sugar, and other Spices in order to taste food	Frequency	1	3	5	84	4	97
	Weighted Scores	1	6	15	336	20	378
	Percentage	0.26	1.59	3.97	88.89	5.29	100.
Poor eye sight for reading labels	Frequency	11	4	17	59	6	97
	Weighted Scores	11	8	51	236	30	336
	Percentages	3.27	2.38	15.18	70.24	8.93	100.

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In table 1, out of 97 valid respondents, approximately 63.9%, 19.0%, 12.8%, 3.5% and 0.75%, respectively, expressed always having, often, sometimes, rarely and never experienced constipation. From Table 1, respondents unanimously stated that they *often* had difficulty chewing and swallowing their food, with the majority, 77.82% indicating that they *sometimes* experienced diarrhoea after eating certain foods. Further, 88.89% of the respondents *often* added salt, sugar or spices to taste food properly. Approximately 70.24% stated that they *often* had their food choices conditioned by the inability to read food labels.

Physical Characteristics of the Elderly (FGD)

Five out of the six participants identified with letters A, B, C, D E, revealed that aging is generally associated with physical changes across generations and gender. Participants enumerated greying, stooped appearance, slower movement, joint and general bodily pains, loss of teeth and ill-fitted dentures, skin wrinkle, poor vision and hearing as some physical changes associated with the aging process. Participants mentioned specific physical changes were (1) Hip degeneration (*A, C, F*); (2) balance issues (*B, C*); (3) Bald hair(*E*) and (4) Hair loss(*D*).

Clinical and Physical Changes with AgingParticipants A, B, C, D, and E confirmed diseases often experienced and reported by the elderly as cardiovascular diseases (*A, F, E*), prostate(D), blood pressure (*B, C*), diabetes (*A, B, C, F*) and hypertension (*D, E, F*). Participants added that these diseases were mainly due to lifestyles and eating foods hitherto not found in the area. Participants reported that clinical and physical changes influenced their abilities to live independently, initiate and maintain physical activity, be socially engaged, and cope with change and pace of work. Additionally, participants hinted that such changes have led to some of them intensely using community health facilities and depending on others for survival. In the words of participant *E* in "*an uncertain world where a g e i n g is certain, I sit idle and rely on the benevolence of others"*. Participant *B* also said, "*until now, eating any food was optional but now eating hard foods, and dairy products remain a luxury due to loss of my teeth.*

Nigam and Knight (2017), asserts that digestive problems and physical immobility are common clinical and physiological changes in the aged across all cultures. Thus, gastrointestinal conditions emerged as clinical and physical characteristics of the elderly in the Kwahu-South District within the study period. The implications of these findings are three-fold. First, poor dentition coupled with changes in sensory organs had impacted the food choices and the ability of the elderly to chew preferred foods. Clinical and physiological changes, as observed in this study, generally revealed aging as an enduring stage in the development of humans.

Additionally, they directly impact adults' usage of health facilities, caregivers and adaptation to their environment. Finally, it helps to partially explain why two elderly persons of the same age in the study area were seen to differ markedly in physical appearance. These findings are consistent with studies by Garcia-Bailo, Toguri, Eny, El-Sohemy (2009): Emilien and. Hollis (2017) and Marcelino, Couronne, Köster, and Sieffermann (2001) confirmed that food palatability, eating patterns, taste, smell, texture, appearance-specific satieties, and food form as significant determinants of food habits. These findings confirmed the immunological theory of ageing that stipulates that a man's immune system is programmed to decline over time due to clinical and physiological changes (Fulop, Witkowski, Pawelec, Alan, Larbi, 2014: Boss, & Seegmiller, 1981). Both behavioural and wear and tear theories of aging, which explain that

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the human body is programmed to decline ‘`over time due to stress, oxidative reaction, free radicals, toxins, etc., have been vindicated by the findings on clinical and physiological statuses in this study (Dong, Milholland, & Vijg, 2016.: Sattaur, Lashley, Golden, 2020).

Research Question 2: What are the food consumption patterns of the elderly in the Kwahu South District of Ghana?

This research question focuses on the food consumption patterns of the elderly, specifically concentrating on the types of foods eaten, how they are stored, drivers of food habits, and the relationship between the physiological status and food habits of the elderly.

Table 3 Respondent’s Selection for Animal Products

Animal product	Frequency	Percentage%
Game	**46**	**47.4**
Fish	**24**	**24.7**
Eggs	**16**	**16.5**
Pork	**08**	**08.3**
Poultry	**02**	**02.1**
Meat	**01**	**01.0**
Total	**97**	**100.00**

In table 3, the most selected animal products that respondents cooked and stored regularly within the study period were game (47.4%), fish (24.7%), egg (16.5%) and *pork* (8.3%) with *meat* (1.0%) as the least selected animal product. Respondents indicated that on any given day, they wanted their animal products in the form of *boiled*, *minced* and grilled, respectively.

Table 2 Respondents' Selection for Cereal

Cereals	Frequency	Percentage (%)	Cumulative Percentage
Rice	33	34.0	34.0
Maize	22	22.7	56.0
Wheat	19	19.6	76.3
Sorghum	15	15.5	91.8
Millet	7	7.2	99.0
Others	1	1.0	100

In Table 2, the respondents’’ preferences for cereals were rice 34.0%, Maize 22.7% and Wheat 19.6%. However, respondents quickly added that cereals formed a minute portion of their daily diet compared to root crops and plantain. The selection of root crops and plantain was justified because the respondents considered a healthier alternative to cereals on any day. More so, their selection as opposed to cereals hinged on the abundance of yam, potatoes, cassava and taro in the study area and the fact that they could be eaten as boiled, boiled and mashed, fried and boiled and boiled and pounded as fufu.

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Respondents' Selection for Vegetables

Table 3. Respondents' Selection for Vegetables

Vegetable	Frequency	Percentage%
Garden eggs.	**27**	**27.8**
Leafy vegetables	**22**	**22.7**
Tomatoes	**21**	**21.7**
Okro	**17**	**17.5**
Others	**10**	**10.3**
Total	**97**	**100**

In Figure, 27.8%, 22.7%, 21.7% and 17.5% of the respondents preferred garden eggs (aubergine), leafy vegetables, tomatoes *and* okra respectively. The remaining (10.3%) of the respondents preferred other vegetables like 'krobonko', 'efrj' (Butternut Squash), 'bokɔbokɔ' garlic, green beans and cabbage. The majority 91.6% of the respondents opted for vegetables in soups and stews.

Table Respondents Selection of Fruit

Vegetable	Frequency	Percentage	Cumulative Percent
Banana	62	63.9	63.9
Mango	19	19.6	83.5
Pawpaw	9	9.2	92.7
Orange	5	5.2	97.9
Others	2	2.1	100.0
Total	97	100.0	100.0

In Table 2 63.9%, 19.6%, 9.2% *and* 5.2% of the respondents selected banana, mango, pawpaw and orange respectively. Of the 2.1% of respondents who favored other fruits, they specifically indicated their liking for pear, pineapple, watermelon, honeydew melon, cucumber, lemon, miracle berry (used in place of sugar), pumpkin, and coconut for their low cholesterol levels and medicinal properties.

Results from FGD

Table 6 Participants' Like and Dislikes for some food

Participant	Likes	Dislikes
Animal products		
B	Game, fish	Meat, poultry
D	Eggs, snail, mushroom	Meat
E	Eggs, snail, mushroom	Meat, milk
F	Game, fish	Meat, milk

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Fruits	
A	Banana, orange, mango, pineapple, watermelon
B	Banana, orange, mango, pineapple, watermelon
C	Banana, orange, mango, pineapple, watermelon
D	Pear, coconut, tiger nut
E	Pawpaw, lemon, grape
F	Pear coconut, tiger nut
Vegetables	
A	Onion, kontomire,
B	efan, okro, agarden eggs
E	efan, okro, garden eggs
F	Onion, kontomire, “3fr3”
Root and Tubers	
A, B, C, D, E, F	Potatoes, cassava, plantain, yam, cocoyam taro
Cereals	Polished cerea
A, B, C, D, E, F	Cereals

In **Table 6**, when asked what foods participants believed the elderly in Kwahu-South District either liked or disliked, foods such as snail, game, fish, egg, yam, cocoyam, taro ripped plantain, potatoes, fruits and vegetables ranked high among the likes with foods such as meat, polished cereals and poultry ranked high on the list of dislike.

First, this study established that the elderly in the study area generally viewed fruit, vegetables, animal foods, particularly game and snails, as healthy eating and thus vital for their growth. However, the finding reaffirms the World Health Organization’s (WHO, 2011) assertion that the elderly population does not sufficiently consume fruit and vegetables in Ghana and their consumption is seen as one of the best remedies for preventing numerous health hazards associated with aging. Specifically, the elderly of Kwahu-South District stated that they would select fruits and vegetables except that their selection and use of fruits were conditioned by cost and availability. Furthermore, consistent with theory, the clinical and physiological status of the elderly did not permit the elderly in the study area to actively engage and experiment with a wider variety of foodstuffs and how they are prepared.

The implications of these findings are two-fold. First, the financially constrained elderly in the study area will likely remain marginalized in eating fruits and choosing healthy eating patterns. High preferences for boiled, minced, grilled, squeezed, soft and blended foods by the aged in this study could be viewed as natural adaptations to the aging process.

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Table 5 Drivers of Food Habits

Indicators	FGD Participants' Choice of Indicators					
	A	B	C	D	E	F
Food aesthetics (taste, smell)	☑	-	☑	☑		☑
Economic (cost, availability)	☑	-	☑	-	☑ -	-☑ ☑
Psychological (mood, stress)		-	☑	-	☑	
Sociological (culture, peers)	☑	-		-		
Biological (hunger, appetite)		-	☑	☑	-	☑
Others (nutrition knowledge)	☑	-	☑		☑	

Table 5 indicates that over 50% of the respondent stated that their food habits are influenced by aesthetic factors like the taste and smell of the foods, economics, and their biological condition such as the presence of diseases, appetite or hunger.

The implications of these findings are two-fold. First, the financially constrained elderly in the study area are likely to remain marginalised in eating fruits and choosing a healthy eating pattern. Secondly, in line with previous research, results here suggest that there are myriad interwoven factors that influence adult eating behaviour (Emilien &Hollis, 2017). These findings reaffirm Chalermsri, Herzig van Wees, Ziaei, Ekström, Muangpaisan, and Rahman (2020) view that biological, economic, physical, social, psychological and cultural factors affect the food choices of the elderly. The study's findings on food preference lend credence to previous literature that the loss of a spouse is a major driver of poor nutrition among the affected elderly (Patterson &. Veenstra, 2010). These findings imply that policies aimed at influencing elderly food choices in the study area should be multidisciplinary in nature.

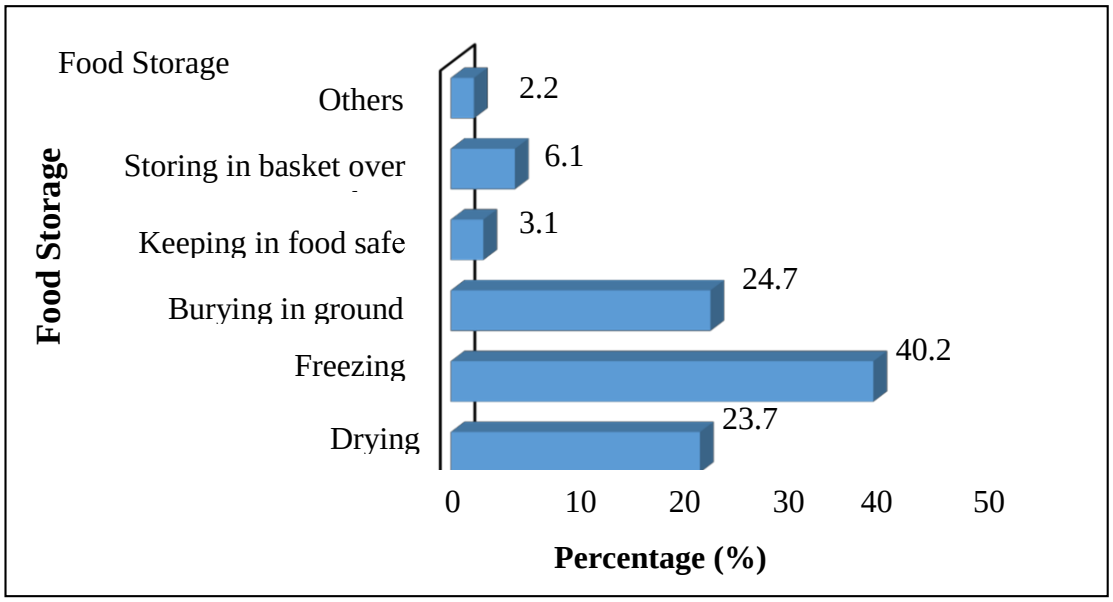

Fig 4: Respondents Preferred Modes for Food Storage

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In Fig., 23.7%, 24.7%, 3.1%, 40.2% and 6.1% of the respondents stored their foods generally by drying, burying them, food containers, refrigeration and storing them in baskets over hearth, respectively. The findings imply that policies aimed at influencing elderly food choices in the study area should be multidisciplinary in nature. Those who asserted that the elderly relied on other modes of food storage backed their stance by asserting that food cravings significantly influenced how they stored food. These findings reaffirmed the findings of Rudra, Basu, and Chanda (2022), and Saraswat and Deepti (2020), on how an individual's attitude influences how one stores food.

CONCLUSIONS

The physical and clinical status of the elderly, such as loss of teeth, a decline in their senses, and some age-related diseases, influences the food preference of the elderly. At the time of the study, respondents ate a banana, watermelon, mango, pawpaw and oranges as their preferred fruits, and garden eggs, leaves, okra, and tomatoes as their preferred vegetables. However, they ate these vegetables and fruits either boiled, mashed, minced, squeezed or blended. Again, lack of mobility and the cost of food affect the way the elderly select and prepare their food.

RECOMMENDATIONS

This study recommends exploring initiatives like instituting National Aging Coping Centers (NACC) to help the elderly cope with clinical and physiological changes they experience as they age. Closely aligned with this recommendation is that existing schemes like NHIS should be made responsive to the elderly whose clinical and physiological status predisposes them to use health facilities and health practitioners intensively.

Secondly, the study recommends that food be made available to the aged on an affordable and all-year-round basis. Again, encouraging initiatives to aim at developing and deploying more options to supplement boiling, squeezing, pounding and blending to aid the aged enjoy their preferred foods would be significant.

Further, instituting policies like adult cuisine and daycares would help the elderly cope with their psychological challenges, particularly losing a spouse that adversely affects their food choices and intake.

Further research is recommended on the formulation of food that suits the physiological status of the elderly. Again, further research should be conducted to ascertain the impact of physical and clinical status and food habits on the nutritional status of the elderly.

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