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DOCTORAL RESEARCH AND TRAINIG CENTRE (CRFD) IN "SOCIAL AND EDUCATIONAL SCIENCES"
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QUALITY OF LIFE THROUGH FEEDING AND COGNITIVE FLEXIBILITY OF THIRD AGE PERSONS

A dissertation submitted in partial fulfilment of the requirements for the award of Master Degree in *Specialized Education* **(EDS)**

Specialty: Mental Disability

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By

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SYNOPSIS

To

The TIKUM and KWAK Families

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LIST OF ABBREVIATIONS AND ACRONYMS

AD : Alzheimer disease

AI : Age International

BDI : Beck Depression Inventory

CF : Cognitive flexibility

EF : Executive function

FRQoL: Food-related quality of life

GRH: General research hypothesis

GRO: General research objective

GRQ: General research question

HRQol: Health-related quality of life

IAEA: Agence International de l'Energie Anatomique

MCI : Mild Cognitive Impairment

NHP : Nottingham Health Profile

NINCDS-ADRDA: National Institute Neurologic, Communicative Disorder and Stroke Alzheimer Disease Related Disorders Association.

OECD: Orgainization for Economic Coorperation and Development

PPCT: Process, Person, Context, Time model

QoL : Quality of life

SCT: Social Cognitive Theory

SF-36: Short Form Health Profile

SIP: Sickness Impact Profile

SRH: Specific research hypotheses

SRO: Specific research objectives

SRQ: Specific research questions

TBP: Theory of Planned Behaviour

TRA: Theory of Reasoned Action

UN: United Nations

WHO: World Health Organization

WHOQOL: World health organization Quality of Life

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ABSTRACT

This study entitled "Quality of life through feeding and cognitive flexibility of third age persons" aims at grasping how third age persons' feeding lifestyle can maintain or delay declines in their mental flexibility. Executive function declines are at a rise in our societies. The interplay between environmental challenges and changes occurring during specific periods of people's development has played a role in that. With the fast growth in the population of older adults, this has become an even greater call for mental health concerns. As, health or its absence in this rapidly increasing population does not only affect the individuals concerned, but the society at large. Hence, the rise in demand for multi-sectorial interventions to promote longer, healthier and active lives, among which the nutritional regime plays a central role. Thus, we wondered how the cognitive flexibility of the third age person could be maintained in order to preserve his autonomy and independence at the same time. We therefore hypothesized that intervention on lifestyle through diet can maintain or delay declines of cognitive flexibility in third age persons. To test this assumption, we conducted a qualitative research making use of the multiple case study method (four participants). The results obtained were analyzed using the thematic content analysis, which revealed that dietary quality of life maintains mental flexibility in third age persons through reciprocal interaction (process), person and time. This result therefore gives relevance to the initial hypothesis, and joins other researchers who affirmed that quality feeding plays a major role in older adults' executive and cognitive states.

Keywords: Ageing, feeding, quality of life, eating behavior, cognitive flexibility, elderly

RÉSUMÉ

Cette étude intitulée : « Qualité de vie par l'alimentation et flexibilité cognitive des personnes du troisième âge » vise à comprendre comment le mode d'alimentation de la personne du troisième âge peut maintenir ou retarder le déclin de sa flexibilité mentale. Le déclin des fonctions exécutives est en augmentation dans nos sociétés. L'interaction entre les défis environnementaux et les changements survenant au cours des périodes spécifiques du développement des personnes a joué un rôle à cet égard. Avec la croissance rapide de la population des personnes âgées, ce phénomène est devenu encore plus préoccupant pour la santé mentale. En effet, la santé ou son absence au sein de cette population en croissance rapide n'affecte pas seulement les individus concernés, mais aussi la société dans son ensemble. D'où l'augmentation de la demande d'interventions multisectorielles pour promouvoir une vie plus longue, plus saine et plus active, parmi lesquelles le régime nutritionnel joue un rôle central. Ainsi, nous nous sommes demandé comment la flexibilité cognitive de la personne du troisième âge peut être maintenue afin de préserver en même temps son autonomie et son indépendance. Nous avons émis l'hypothèse selon laquelle l'intervention sur l'hygiène de vie à travers le mode alimentaire peut maintenir ou retarder le déclin de la flexibilité cognitive chez les personnes du troisième âge. Pour éprouver cette hypothèse, nous avons procédé par une recherche qualitative en utilisant la méthode de l'étude de cas multiples (quatre participants). Les résultats obtenus ont été analysés à l'aide d'une analyse de contenu thématique, qui a révélé que la qualité de vie alimentaire maintient la flexibilité mentale chez les personnes du troisième âge par le biais d'une interaction réciproque (processus), de la personne et du temps. Ce résultat donne donc de la pertinence à l'hypothèse initiale, et rejoint d'autres chercheurs qui ont affirmé que la qualité alimentaire joue un rôle majeur dans les états exécutifs et cognitifs des personnes âgées.

Mots-clés : Vieillissement, l'alimentation, qualité de vie, comportement alimentaire, flexibilité cognitive, personnes âgées.

GENERAL INTRODUCTION

0.1. CONTEXT AND JUSTIFICATION

The elderly's population is rapidly increasing, a greater number of people around the world are now more likely to reach late adulthood than in the past. The World Health Organization (WHO) has discussed the rapid growing of older population especially in the middle and low-income countries. In 2017, there were 962 million people aged above 60 years worldwide, with this number increasing by 3% all over the globe every year. In 2018, approximately 50 million aged people suffered from dementia. It is now expected that over the next 40 years to come, developing countries like ours will be a home to about 80% of the population of older adults in the world (Nazri et al., 2020).

Although a higher life expectancy is usually regarded as a blessing, the dramatic global increase in life expectancy over the years now calls for emphasis to be placed on healthier life alongside longer life for third agers. As, this growth in population goes hand-in-hand with population's health profiles wherein there may be significant challenges at the economic and health entities (specifically mental health). The UN in its Plan of Action on Ageing had stated in view of this that, actions towards older adults should include everything that would maintain their autonomy and decision-making processes. Since autonomy has an important role to play in active aging, given it is strongly associated with longevity and prevention of cognitive deterioration among the elderly (Sanchez-Garcia et al, 2019).

Also, our environment is characterized by daily changes which requires adaptive capacities to overcome unexpected situations, obstacles and novelty as a whole. Meanwhile ageing comes with changes that affects the functioning of cognitive processes like cognitive flexibility (CF), given that it allows the changing of both behaviour and thinking abilities. Hence, constituting an essential threat to adaptive, goal-oriented behavior (Richard's et al., 2019). To make things even clearer, Milte et al, (2019) explain in details how the ageing brain undergoes changes including steady decreases in brain size accompanied by age-related cognitive decline. A process characterized by gradual declines in cognitive functions including processing speed, reasoning, memory and executive functioning from mid-adulthood onwards

Therefore, increase in the world's elderly population could imply an increase in the number of individuals experiencing age-associated cognitive impairment and declines. Which in turn may

lead to a fast growth of older adults void of autonomy and independence, and hence a burden to their families first, and then to the society at large.

Whereas autonomy is an essential concept in that it relates directly to dignity, regardless of health circumstances (Sanchez-Garcia et al, 2019), and maintained flexibility can improves quality of life. For this reason there is the need to identify factors that may help the elderly maintain, improve, or even reduce declines in mental processes in the face of advancing age (Stough & Pase, 2015). So, preventive interventions are solicited among which dietary quality of life in order to ensure healthy ageing. For, as the number of older people increase, more information on natural means of intervention such as nutrition in older populations will be needed.

To emphasize this, Nazri et al. (2020), state: "quality of life, health status and functional independence of older adults depend highly on their nutritional well-being." Nutrition among older people is associated with functional ability and quality of life (QoL) (Jyvakorpi, 2016). And the effects of nutrition on health are not limited to the individual but can be passed on to the next generation (Ribaric, 2012), making it a call for action so much so that Shabir (2020) insists on adopting correct dietary changes to slow down functional/executive declines in elderly individuals. To him, a**s** to many others, specific tasks can be performed in healthy elderly people, and actions are taken to slow down cognitive decline and in some cases successfully maintaining and improving mental wellbeing.

In alignment to all of these, older persons' wellbeing is not something to be taken lightly. Several legal papers mention the necessity for their rights, autonomy and wellbeing to be maintained. Many organizations (WHO, World bank, Help Age International) advocate for and promote the right of older people so that older people can develop their potential as well as be assured of the basic necessities of life (Nangia, 2016). And by so doing, welcoming the increase in life expectancy, and the potential of older populations as a powerful development resource for the future, laying emphasis on their skills, experience, wisdom, and the many other contributions they can make and bring forth.

In the African context also, the old person's situation is beginning to be looked into. For instance the Lesotho Policy for Older Persons advocates for the observance of the rights of older persons by establishing structures that will improve their status and their wellbeing (MoSD, 2014). The general obligation that came forth towards older adults stated that it should contain among others:

> A guaranteeing protection and promotion of the human rights of older people. Taking all appropriate measures to eliminate discrimination against people in older age. Undertaking or promoting research on ageing and on issues particularly affecting people in older age. Providing accessible, appropriate information to older people on their rights and entitlement to benefits and resources. Taking all appropriate measures to allow for older people's full and effective participation in society and decision-making processes.

This same country equally lays emphasis on older people's rights to autonomy and independence, self-determination and choice in all aspects of life such as decision-making. The right to long term support for independent living characterized by a person-centered, quality, affordable, appropriate support.

Cameroon on its part counts about 25 million people among whom 3.5% are aged 60 years and above (Nkewscheu et al, 2021). In relation to the wellbeing of this population, one can note the creation by Decree No.2005/160 of May 25th, 2005 to organize the Ministry of Social affairs with a Department of the Social Protection of Persons with Disability and Older Persons in support of them because age is a major risk factor for dementia associated with a progressive loss of cognitive abilities that leads to loss of independence, the loss of autonomy and eventually death. For, even those who do not go on to develop dementia are likely to experience some decline in executive abilities (Singh-Manoux et al., 2012 cited by Stough & Pase, 2015).

As such, helping individuals improve or maintain their cognitive flexibility in the face of advancing age is thus an important area of research. All of these and more has become a call for concern and thorough investigations. Hence, a justification for this study.

Another justification for this study lies in the fact that for the first time, countries worldwide are facing a growth in the population of the old rather than the young as it had been the habit. And, the burdens of unhealthy ageing associated with chronic non communicable and other

age-related diseases may be largely preventable with lifestyle modification among which diet/feeding. Which calls for actions to be taken such that the third age population would not become a burden, but will contribute actively to the growth and economy of the nation in which they live.

Also, there have not really been a lot of studies on the well-being of the aged, focus on nutritional standards in view of autonomy and growth had for a long time focused on maternity and babies' feeding, excluding the old. The above are justifications for the orientation of this study towards the nutritional contribution of quality feeding to cognitive flexibility amelioration in older people in view of their independence and autonomy in a fast-growing world.

0.2. FORMULATION OF THE PROBLEM

Ageing is a part of everyone's life. It is a continuous and progressive process of natural deterioration that begins from birth and becomes more pronounced in early adulthood. Changes may affect some people earlier than others, but the most notable differences among people of the same age are caused by lifestyle, habits or the effect of diseases. The early middle age marks the beginning of many gradual bodily functions decline. Internal changes from natural ageing like the thickening and stiffening of the lens of the eye such that it becomes less able to focus on close objects like reading materials is observed as people grow older. In addition, it is noted in old age the loss of strength and endurance; decrease in thirst and taste of food; reduction in appetite; sensitivity to noise which may result in fragmented sleep; the old may take longer to understand and perform tasks; and with ageing comes reduction in concentration capacity accompanied by forgetfulness or memory loss.

Memory loss is particularly frequent in old persons generally, with dementia being one of the current cause of morbidity in the old. The prevalence of dementia is approximately 1% between ages 60 – 64 and 3% between ages 65 – 74. The most common form of dementia, the Alzheimer's disease actually causes people to have difficulties doing normal tasks and understanding their environment. It triggers a decline in thinking skills (cognitive abilities) severe enough to impair daily life and independent function. Alzheimer also causes deep progressive degeneration or shrinkage of nerves tissues, hence the ageing of brain structures in involution. This disease is associated to neuropathological characteristics such as cortical atrophy (that is, the gradual and progressive degeneration of the brain), and is expressed by a progressive and global deterioration

of cognitive functions alongside the outbreak of emotional and behavioural disorders, says Dujardin and Lemaire (2008). Hence, severe memory loss as observed in many third age people in our community is as a result of pathological ageing.

As such, a projected doubling in the worldwide population of third age persons by the year 2050 as reported by the World Health Organization, will have major health implications especially for developing countries. Considering that ageing is a societal phenomenon, advanced age is often welcomed as a blessing in most societies, however, these gained years should be lived in good cognitive capacities and not cognitive incapacitation. For, if the fight over increasing lifespan has been won, the question of the cognitive flexibility of third age people still stands and remains a central point in the overall adaptation of this age group to changes in the society. An understanding of the ageing process therefore is important to improving well-being among old people. Wenger et al., (1984) present quality of life as individuals' perception of their functioning and well-being in different domains of life. It is a multidimensional construct, consisting of both objective, subjective and relational factors which equally encompasses life satisfaction of both physical and mental well-being. As such, quality of life looks at how third age people measure "goodness" of multiple aspects of their lives.

People of the third age range are those aged 65 years and above according to WHO. They are often on retirement stage and could face physical, social and cognitive limitations. Laslett (1992) says of the "Third Age" that it is that period in which people are freed from work and family constraints and have time to pursue a good quality of life. In the same light. Giving an understanding that it is an age bracket based on health and leisure rather than infirmity and poverty (Wiggings, 2004). However, this is not always the case of third age persons in our communities. Their cognitive state, specifically their flexibility face a lot of decline leading to loss of autonomy, lack of freedom, and consequently dependency resulting from their past life exposures and environmental effects.

In relation to this, Piaget as reported by Hannachi (2005) explains that cognitive development is generally characterized by qualitative changes that results from already existing cognitive structures. To him, individuals' knowledge are linked to interactions with their environment, which they seek understanding of. As such, they build their knowledge in relation to what they already know about the external world. Goigoux and Vergnaud, (2005), explained this

in terms of the pair “schema-situation”. To them, knowledge is a formidable process of adaptation during which schema adapts to situation. In this way, it is the pairing of schema and situation that allow individuals to identify the critical moments of their development. Therefore schema becomes a privileged tool in describing the process of competence development.

To Vergnaud, schemas, being those cognitive elements that permits the individual’s action to be operational, are at the center of adaptive processes of cognitive structures. He defines a schema to be an invariant organization of activities for a definite class of situations (2001, p. 4). It is universal since it addresses a class of situation whose characteristics are well defined. He further goes to distinguish two big classes of situations: firstly, situation classes for which the subjects has in his repertoire at a given moment of his development and in certain circumstances, competences necessary for relative immediate treatment of the situation. And secondly, situation classes for which the subject does not have all the necessary skills, which forces him to spend time thinking and exploring, to hesitate, to make aborted attempts that was to lead him to success, lead him to failure.

In the same light, Bandura’s Social Cognitive theory states that individuals are proactively engaged agents in their own development, and can make things happen by their actions. Among the personal factor, they possess self-beliefs that enable them to control their thoughts, feelings, actions, as these affects how they behave (Bandura, 1986, p.25). Bandura emphasizes that cognition plays a critical role in people’s capacity to construct reality, self-regulate, encode information and perform behaviours. Making the theory applicable to human adaptation since individuals are viewed as products and producers of their own environment and societal systems. As such, thy can extract meaning from their environment, construct guides for action, cognitively solve problems, support forethoughtful courses of action,, gain new knowledge and communicate with others.

Elderly people’s perception about quality of life is also defined in terms of cognitive flexibility. Knowing with Martin and Rubin (1995) that cognitive flexibility refers to three things, a person’s (a) awareness that in any situation there are options and alternatives available, (b) willingness to be flexible and adapt to the situation, and (c) self-efficacy in being flexible in any situation. So seniors have resources and potential to be enhanced, and active ageing is considered as the process of optimizing opportunities for health, social participation and security in order to

enhance quality of life as people age. Making quality of life and overall well-being the result of a dynamic process analyzed as an attitude to self-acceptance, self-esteem, autonomy, control over the environment and personal growth, including the establishment of positive relationships (Ryff, 1999).

Although each elderly person has his point of view concerning feeding quality of life and cognitive flexibility, the variability between individuals does not cancel the fact that this type of quality of life plays a role in cognitive flexibility. As cognitive flexibility abilities allows for appropriate use of individual abilities to regulate cognition in situations like understanding and problem-solving (Spiro & Jehng, 1990). Researchers' results show that cognitive flexibility enables greater success in achieving desired goals. However, third age persons in our community still face difficulties to flexibly adapt to novelty or unexpected changes; they have difficulties alternating between perspectives; displaying goal-oriented behaviours and solving problems around them. In brief, their loss of flexibility leads to the loss of autonomy and independence.

0.3. RESEARCH QUESTIONS

0.3.1. General research question

In regards to the research problem brought up above, the main research question is:

GRQ: How does dietary quality of life maintain cognitive flexibility in third age persons in view of preserving their autonomy and independence?

0.3.2. Specific research questions

SRQ 1: How does reciprocal interaction (process) maintain cognitive flexibility in third age people in view of preserving their autonomy and independence?

SRQ 2: How does "person" maintain cognitive flexibility in third age persons in view of preserving their autonomy and independence?

SRQ 3: How does time maintain cognitive flexibility in third age persons in view of preserving their autonomy and independence?

0.4. RESEARCH OBJECTIVES

0.4.1. General research objective

GRO: To grasp how dietary quality of life maintains cognitive flexibility in third age persons in view of preserving their autonomy and independence.

We think that modification of feeding lifestyle into the right feeding style is important and would maintain or even ameliorate cognitive flexibility in people of the third age, such that their autonomy and independence remain.

0.4.2. Specific research objectives

In order to keep our work organized and focused, we have brought fort the following specific objectives for this study:

SRO 1: To apprehend how reciprocal interaction (process) maintains cognitive flexibility in third age people in view of preserving their autonomy and independence.

SRO 2: To grasp how "person" maintains cognitive flexibility in third age persons in view of preserving their autonomy and independence.

SRO 3: To grasp how time maintains cognitive flexibility in third age persons in view of preserving their autonomy and independence.

0.5. ORIGINALITY AND PERTINENCE OF STUDY

0.5.1. Originality of study

In Cameroon as it is the case of many developing countries, studies on the nutritional benefits that quality feeding can grant older people is still overshadowed by maternal and child health. Meanwhile most older adults need more services and care than younger adults and so the primary goal of any system that addresses the needs of older adults should be to help these group of individuals maintain as much functional independence as possible.

To achieve this goal, awareness on the situation of health risks, sensitization on the topic should be prioritized. This way, information on the possibility to improve old people's lifestyle in general and cognition in particular through affordable preventive methods like feeding quality would be made known and practiced. All of these in alignment too to the purpose of the creation of the Ministry of Social Affairs' (MINAS) Department of the social Protection of Persons with

Disability and Older Persons. For age is a major risk factor necessitating lots of care for the prevention of certain disabilities.

This study is therefore original in that it is interested in the well-being of the aged person and will create awareness on the importance and influence that quality of life through nutrition has on third age person's flexibility. This will at the same time increase or improve the elderly's independence and autonomy and even the overall mental state/life of this quickly growing population. By so doing, bring significant changes in eating habits in favour of healthy feeding. Leading to healthy aging and reduction in the prevalence of age-associated diseases or any other diseases. Hence, the promotion of national health.

Following the projection by the WHO and the UN on the fast growth of the elderly's population worldwide, especially in developing countries like ours in the years to come, a study like this one would equally stand as an economic backbone to societies like our own. This study prioritizes preventive measures over curative measures which are known to be wealth draining. It lays emphasis on the use of daily nutrition in order to maintain mental health or even overall health in the elderly.

Also, scientific literature on the impact of feeding quality of life on third agers in Cameroon is quite thin. For this reason, it is no doubt that this problem could be considered marginal in the human and social sciences, since it only concerns a little fraction of the population. However, there is still concern about it regardless of the popular belief that an aged person is doomed to be frail, meanwhile researches are showing that quality of life and feeding plays tremendous roles on wellbeing and health with advance in age.

0.5.2. Pertinence of study

The scientific significance of this study lies in the fact that it will contribute to the advancement of science by bringing a plus to the literature on the topic. It follows previous researches touching ageing and well-being under the "umbrella" of gerontology and would be well received as additional knowledge by the general public and other researchers in the domain. Also, it is part of our academic scheme of work in the mental handicap specialty and would bring more innovating insights to students and practitioners interested in preoccupations related to this discipline.

The reality of the drop in autonomy in persons of the third age range is an issue of concern in our society. Handling matters around the mental or cognitive flexibility of the ageing person is not just important because it falls under the discipline Specialized Education, but it is equally a powerful

generator of social cohesion in that it acts on an issue that undermines the society due to ignorance or negligence. Thus, this study is of social pertinence as it suggests answers to a problem on which social deciders and practitioners in the domain can take actions upon. In Cameroon, many are those who seek aid from various institutions like hospitals, retreat homes, or even ministries on behalf of their frail parents and hopefully await solutions of some sort, or assistance vis-à-vis of their Old's conditions. The feeling of being deprived of a thing which one feels is his right to have is sometimes blamed on the society with the hard life conditions it leaves the minority population in.

The pertinence of this study is equally seen in that it acts in relation to the rights of older adults, to the law and also to all that which fail to happen in normal ageing as it should, "the pathological". Thus, the fact of adopting under-feeding behaviors or food items less rich in nutrients for support to the ageing brain is a health risk factor in the elderly, and hence implies serious consequences on their mental flexibility as time passes.

0.6. DELIMITATION OF STUDY

Our interest in this study is ageing and feeding quality of life to the elderly's mental wellbeing. Precisely, we seek to understand how quality food intake significantly acts on the cognitive flexibility of third age persons such that their autonomy and independence is not lost, but rather maintained with advancing age. For this reason, our target population are older adults of the third age. The study's design is a qualitative research study, following the multiple case study method, with mode of data collection - the semi-directive interview to healthy persons of the third age capable of participating in the research.

0.6.1. Empirical delimitation

0.6.1.1. The spatial plan

This study was carried out in the center region of Cameroon in Yaounde VI, in a neighbourhood named Etoug-ebe where participants were approached in their own homes. Etoug-ebe is found precisely in the department of Mfoundi. It is surrounded by neighbourhoods (or quarters) like Biyem-Assi and Mvog-Betsi. It is a neighbourhood rich in social amenities such as schools (nursery, primary, secondary and high schools, alongside other private schools, and a government technical school); hospitals; a public rehabilitation center; a market, pharmacies; petrol stations; good water and electricity supply, well tarred roads, to name but a few. These social

amenities are some of the reasons that attracts a large numbers of people including third age people into this locality.

The city of Yaounde, like most towns in Cameroon is now experiencing an accelerative demographic growth, characterized by rural exodus. In Yaounde, we find older adult of all ages and all ethnic groups living in their houses with a very little number of them living in care homes. Some of them left their villages as young men and women in search of greener pastures and became old here, others left their villages already in an advanced age to live in town with their children for reasons best known to them, while others were simply born and raised here and eventually aged here.

It is in this town that we made the observations that first triggered our interest to carryout studies on this population (the third age persons). We wondered why unlike older adults of the past, characterized by activeness, independence and strength, older adults nowadays are more frail, less active and dependent. This pushed us into desiring to know what exactly is ageing and to seek understanding on how natural home remedies like dietary/feeding quality of life can contribute in the maintenance of their overall mental flexibility such that they can continue being active, productive and flexible even in their advanced age. Needing help or assistance in only very rare occasions.

0.6.1.2 The Temporal plan

This study was carried out during the 2021-2022 academic year. Field work was done with elderly persons of the third age group in their own houses. The reason for working with older adults in their homes unlike institutions being that, in relation to questions pertaining to their quality of life and feeding habits, it was important to meet persons who are not under the care of care homes/institutions since this study aims at apprehending their own manner of feeding and living in their advance age. We met readily available healthy older adults willing and capable of partaking in the research in the comfort and protection of their own homes. We sought to work with healthy elderly persons of our age target to make sure that they will be capable to go through with the research as long as it went on. We thought that their ages were already an issue to be considered, and that if they were sick in addition, it might be overwhelming.

The research was carried out over a two (2) weeks period so that pertinent data fit for the study would be gathered. Also, we did not want to rush or put the elderly under pressure, but sought to work with them at their rhythm, pace, and their comfort. Considering that they are adults deserving respect (as a person), and respects of the code of deontology.

The interviews with participants were carried out three times every week following a thematic interview guide, with each interview session with the elderly lasting about 15 to 25 minutes, sometimes more or less, depending on their mood and willingness to continue or ending the sessions. As it is in their rights at any point of the research to put an end to the sessions, if they did not want to go any further.

0.6.2. Conceptual delimitation

0.6.2.1. Third age persons

Although there are many disagreements about the ages that classifies the third age, it is usually defined as beginning from the calendar age of 65 years old. This definition originates from the National Old-age Pension System of Bismarck by the German Chancellor at the end of the 19th century. Marking the third age as an age of retirement.

The term “Third Age” was introduced by Laslett (1992), wherein he defines the third age as the period during which people are freed from work and family constraints and have time to pursue a good quality of life (it is an era of personal fulfillment).

Weiss and Bass (2002, p.3) align with Laslett (1992) in their definition of the third age. According to them, it is that period in life when “there is no longer employment and child raising to seize time, and before morbidity enters to limit activity”. They equally termed it the time of comparative independence marked by “freedom from the demands of earlier life, freedom from the need to earn a living, freedom from responsibilities for others (p. 3, 4).

Combining these information, we understand that third age persons are older adults 65 years and above, yet, not above 85 years old (60/65 to 75/80 years as per the Cambridge university press, 1991), who are now free to enjoy retirement, free from external pressures, and free to settle in for new adventures and personal fulfillment. In this study, we consider third age people those older adults who have crossed the middle age but have not yet reached the oldest stage of old age. In this work, we consider persons aged 60 to 79 years old.

0.6.2.2. Quality of life

According to the APA dictionary, Quality of life (QoL) is the extent to which a person obtains satisfaction from life. It considers the following as important for a good quality of life: emotional, material, and physical well-being; engagement in interpersonal relations; opportunities for personal (e.g., skill) development; exercising rights and making self-determining lifestyle choices; and participation in society. Enhancing quality of life is a particular concern for those with chronic disease or developmental and other disabilities; for those undergoing medical or psychological treatment; and for the aged.

The World Health Organization (WHO) defines quality of life as "an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. It is also the "combination of the effects of the complete range of factors such as those determining health, happiness (including comforts in the physical environment and a satisfying occupation), education, social and intellectual attainments, freedom of action, justice, freedom of operation" (WHO, 1976, p.312)

To Diener et al. (1999) quality of life in a broad sense looks at how individuals measure the 'goodness' of multiple aspects of their lives. Evaluations which include one's emotional reactions to life occurrences, disposition, sense of life fulfillment and satisfaction, and satisfaction with work and personal relationships

Wenger et al. (1984) consider QoL as "an individual's perceptions of his or her functioning and well-being in different domains of life". Their definition takes into consideration what patients think about their internal state, as well as their relationship with other people.

It can therefore be summarized from the above that Quality of life is a multidimensional entity. To Cai et al. (2021) there are two of the dimensions: the internal dimensions which are characterized by how the person feels good about himself; and the external dimension, how the person feels good about others. They emphasize the importance of the importance of the consideration of various cross-cultural and religious dimensions in the definition of this concept, as several factors affecting QoL are affected by the surrounding environment as well. In our study, Quality of life is that which procures well-being to the individual.

0.6.2.3. Cognitive flexibility

Cognition is defined according to the APA dictionary as all forms of knowing and awareness, such as, perceiving, conceiving, remembering, reasoning, judging, imagining, and problem solving. Along with effect and conation, it is one of the three traditionally identified components of the mind. To Bayne et al., (2019) cognition comes from the Greek word "cognicioun", meaning ability to comprehend, mental act or process of knowing; and the Latin word "cognoscere", meaning to get to know or recognize. For Mather (2019), cognition in humans is defined as "all the processes by which the sensory input is transformed, reduced, elaborated, stored, recovered and used".

While Flexibility has been considered one of the three main executive functions allowing the exercise of cognitive control, along with inhibition and updating in working memory. (Miyake et al., 2000). To Payne et al. (1993), flexibility is seen as an adaptive capacity of individuals.

Cognitive flexibility, also called mental flexibility is defined by the APA dictionary of psychology as the capacity for objective appraisal and appropriately flexible action. Cognitive flexibility also implies adaptability and fair-mindedness.

According to Clement (2022), cognitive flexibility is defined as that which allows one to adapt to a constantly changing environment, discover solution in new or unexpected situations, transfer knowledge learned in a context, select relevant stimuli in the environment, achieve a goal, switch attention from one stimulus to another according to constraints of the situation, alternate between two possible forms of processing stimuli, and to exchange representations of the goal we are pursuing.

Canas et al. (2003) on their part defined it as the human ability to adapt the cognitive processing strategies to face new and unexpected conditions in the environment. Through this definition, they brought forth three important characteristics of the concept namely: cognitive flexibility as an ability; an adaptation of cognitive processing strategies; and a task performance (Canas et al. 2006). The first characteristic suggests that cognitive flexibility can be seen as an ability, meaning, it is a process of learning that can be acquired with experience. The next suggests that cognitive flexibility involves the adaptation of cognitive processing strategies. Strategies here implies a sequence of operations which search through a problem (Payne et al. 1993, as cited by Canas et al. 2006), hence, cognitive flexibility refers to change in complex behaviour, rather than

just some responses. And the third characteristic suggests that it is only after a person has been carrying out a task that adaptation to unexpected changes in the environment may occur.

Another definition of Cognitive flexibility refers to a person's (a) awareness that in any given situation there are options and alternatives available, (b) willingness to be flexible and adapt to the situation, and (c) self-efficacy in being flexible. In any given situation, a person has a choice about how to behave (Martin &Rubin, 1995).

To Dennis and Vander-Wal (2010), cognitive flexibility generally refers to an individual's ability to shift cognitive sets and adapt to one's changing environment.

All in all, we understand that cognitive flexibility is the individual's ability to adapt to changes in the environment. In this study, we will consider cognitive flexibility in older adults as their ability to continuously adapt to the changes occurring in and around them, through the change of complex behaviours, enabling them to maintain their autonomy and independence through flexible abilities. Like their ability to keep playing the role of parents, grand-parents (for those with families) through the transmission of knowledge and counsel, and be able to flexibly care for themselves, such that they may require only very little assistance where necessary.

0.7. PRESENTATION OF WORK

This work is structured into five chapters. Chapter 1, titled ageing and cognitive flexibility, aims at bringing understanding on these concepts as they are key concepts to the study. Chapter 2 is termed quality of life, for the same purpose. Chapter 3 is a presentation of the research's methodology. Everything pertaining to the method used in this study will addressed, including the research hypothesis, population of study and more. Chapter 4 is the presentation and analysis of results, and the final chapter (5) is the interpretation of results.

CHAPTER 1:
AGEING AND COGNITIVE FLEXIBILITY

The purpose of this first chapter labelled "ageing and cognitive flexibility" is to present the above two key concepts as understood in the literature, and as considered in this study. On the one hand, we will be presenting ageing in a broad but non-exhaustive manner, presenting its effects; mechanisms; types, to name but a few. On the other hand we shall discuss the concept of cognitive flexibility; its definitions; generalities, its importance; how it is influenced by the ageing process, and more.

1.1. AGEING

Ageing is a slow, progressive, programmed and continuous process that begins from conception and follows up throughout life. As it does with all animals, life for a human begins with a single cell and progresses through a series of developmental stages. The human foetus becomes an infant; the infant, a child; the child, an adolescent; and the adolescent, an adult. The final stage of human development being old age (Aiken, 1995). I n this view, the term ageing can therefore be defined as a process of progressive, accumulative functional decline that occur with time, leading to disability, dependence, morbidity, mortality. Tittikpina et al. (2019) define ageing as the time-related progressive physiological changes in an organism that lead to a deterioration or decline of the biological functions and of the organism's ability to adapt to metabolic stress. It takes place in a cell, a tissue, an organ, and ultimately the total organism.

The developmental perspective to ageing acknowledges that the process of ageing or growing old is the result of a complex interaction between biological, psychological and social factors. These factors occur within multiple context, multiple conditions and are shaped by personal, genetic, cultural, historical, environmental, economic factors, to list but a few (Medeiros, 2017). The WHO (2021) states that "at the biological level, ageing results from the impact of the accumulation of a wide variety of molecular and cellular damage over time, which leads to a gradual decrease in physical and mental capacities, a growing risk of disease, and ultimately death".

These changes are neither linear nor homogeneous and are not closely associated with the number of years.

The diversity observed in old age is not the result of chance, but the result of the interrelated effects of genetic factors and environmental factors to which the body is subjected to throughout life. It is in this light that Colloca et al. (2020) share the results of recent findings concerning ageing: "… it is a complex process that leads to changes in all the systems of the body and all the functions of a person; however, it develops at different rates in different people, and chronological age is not always consistent with biological age". This, to explain that ageing feels different in different people, since beyond biological changes, ageing is also associated with other life transitions such as retirement, relocation, and various uncontrollable changes and events around the person and his environment. Variability in experiences occurring over the lifetime (e.g. genetics, life quality and lifestyle, diet and nutrition, education, and environmental exposures) have a role to play on the effect that may result with ageing. Determining in this way whether this period would be the best or worst time of life for the individuals concerned.

1.1.1. Effects of ageing

Ageing generally has certain effects on the person with the passing of chronological age.At the level of the Nervous System, ageing's effects are viewed through numerous neuropathological and neurobiological modifications of the Central Nervous System among which, decrease in the number of cortical neurons, the rarefaction of the white matter and the decrease of intracerebral neurotransmitters. Tittikpina et al. (2019) say ageing is characterized by a variety of changes in the body, including muscle loss, thinner skin, and less stomach acid. Manifestations of ageing which are observed at the organism level and sustained by multicausal, progressive, and irreversible modifications that occur at molecular and cellular levels. To Amarya (2018) the ageing of the Central Nervous System results in an increase in reaction time and a moderate reduction in memory performance, particularly in the acquisition of new information, as the capacity of the brain to transmit signals and to communicate reduces.

Ageing is equally accompanied in some people by a reduction of sleep and thirst. A reduced sensitivity of thirst receptors and changes in certain metabolism accounts at least in part for the decreased sensation of thirst in the elderly. These modifications contribute in increasing the

cerebral vulnerability of the elderly to aggression, particularly the risk of confusion syndrome and memory loss.

On the sense organs, the effects of ageing is accompanied by a reduction in accommodation (the ability of the eye to change the focal length of the lens), which makes it difficult to read close reading materials. This process begins in childhood, but its functional consequence appears around the age of 50. In addition to this, there is the progressive opacification of the crystalline lens which starts in later age during the course of ageing, affecting vision (cataract). The ageing of the cochlea results in a progressive loss of hearing in the aged (primarily high tone sounds), and in regards to smell, it is observed with pure ageing that there is in the ageing adult a reduced ability to smell and to detect odours, which affects quality of life and may cause loss of pleasure from eating (Gaines et al., 2010).

Another effect of ageing as explained by the French-Speaking Virtual Medical University (2011) is the ageing of the bones which is characterized by a reduction in bone mineral density (mainly in women due to estrogen deprivation during menopause) and by a decrease in the strength of the bone, which may lead to risks of fracture, frailty, reduction of quality of life and loss of independence (Faulkner et al., 2007).

Ageing equally has some effects on the sexual organs. In women, menopause is accompanied by the cessation of ovarian secretion of estrogen, the disappearance of menstrual cycles, and the involution of the uterus and mammary glands. In men, there is a progressive decrease in testosterone secretion that varies from one individual to another. The impact of ageing on sexual function varies from one individual to another and is not just influenced by hormonal status, but also by social, psychological and cultural factors.

At the level of body composition, the tendency to become shorter occurs in both genders and in all races because height loss is associated with bones, muscle and joints. Height loss is often more rapid after age 70, however, these changes can be prevented by following a healthy diet, physical activities which assists in bone loss prevention and treatment (Ferraro et al., 2008 as cited by Amarya, 2018).

On the skin, the effects of ageing are characterized by an alteration of the elastic tissue. The skin of the elderly takes on a paler appearance, marked by wrinkles and fine lines. The growth rate of hair and nails decreases with age. The reduction in the number of melanocytes contributes to the graying of the hair. The activity of the sebaceous, sweat glands decreases, contributing to a certain dryness of the skin.

In regards to ageing's effect on the immune system, the process of adaptive immunity is globally preserved in the elderly, and immunization conferred by vaccination is not altered in healthy elderly people, although the levels of antibodies produced are lower than those observed in younger people.

According to Murman (2015), ageing causes changes at the level of cognition and the most important changes in cognition with normal ageing are declines in performance on cognitive tasks that requires one to quickly process or transform information in decision making, including processing speed, working memory, and executive functions. Amarya (2018) goes further to explain that a mild decline in overall accuracy is observed with the beginning of the 60s and then progresses slowly. Again, these changes being the results of both intrinsic and extrinsic factors like overall experiences (cultural, physical and social) that influences functioning and cognitive development.

In addition, ageing can equally be marked by the appearance of certain pathologies including somatic diseases and multiple chronic conditions. Among others, diseases like hypertension, diabetes, are mostly common chronic disease of older adults. At the psychological and cognitive level, it is important to note that normal cognitive ageing does not lead to dementia, but the rate of dementia increases with age says Jaul and Barron (2017). The increase in the frequency of certain diseases in elderly subjects can be explained in several ways. Firstly, the duration of exposure to certain risk factors with advancing age, and secondly, the changes induced by ageing (normal ageing) can in some cases facilitate the onset of disease. As Pellisier (2011) rightly described, "cognitive health is based on the ability of a person to think, learn and remember" factors that ageing want to take away from the aged.

1.1.2. Mechanisms of ageing

Ageing as a complex and multi-factorial phenomenon, has some mechanisms at its origin. The various factors although not fully elaborated here are the genetic factors on the one hand and other factors on the other hand. Several studies have shown close links between certain genetic factors and ageing, among which the works of Rodriguez-Rodero et al. (2011), according to whom several genetic factors are implicated in ageing. They affirm that in humans, studies conducted on twins have shown that life span and ageing intensity seems to be strongly linked to genetic factors. The genetic origin of premature ageing syndromes highlights the role of hereditary factors in ageing, while some acquired alterations of the genetic material could be involved in ageing on the one hand.

On the other hand, other factors equally explain the mechanism of ageing. Due to the complexity of ageing and the diversity of factors involved, many mechanisms have been proposed to explain the ageing process. Many "Theories of Ageing" attempting to explain the mechanisms of ageing have been brought up, among which the “Biological Clock Theory”, which states that the ageing process is thoroughly scheduled and that bodily functions deteriorates according to a planned program. The “error theory” on its part states that bodily functions are gradually lost due to damage from external factors (Chang et al., 2017). These same authors add that although numerous theories have been proposed to explain the mechanism of ageing, the fact that there is no one theory that can clearly explain this mechanism is an evidence to the complexity of the ageing process itself. However, the years to come will bring other elements to better understand ageing and its mechanisms.

All in all, looking at ageing, there’s the tendency to begin reflecting on how this process can be slowed down, or the various strategies one can put in place to slow down ageing. Ageing is a consequence of the passage of time. Thus, it is an obligatory and unavoidable phenomenon. However, several research studies have shown that it is possible to influence ageing and longevity. For instance, according to Shetty et al. (2018), there are many anti-ageing strategies in development and multiple procedures to combat ageing and postpone age-related diseases that are showing improvement, such as nutrition and dietary restriction; intermittent fasting; physical exercise; and the intake of antioxidants.

1.1.3. TYPES OF AGEING

1.1.3.1. Normal ageing

The passage of time modifies several biological processes in the individual. The ageing process appears very differently and at different speed depending on the individual, but in the end, no one can avoid it, it occurs throughout all organs of the human body (Chang et al., 2017).

Ageing is characterized by progressive and predictable changes even though this process is not homogenous, since people of the same age may age differently and at different rates. Most of the changes come from internal processes (from ageing itself). For this reason, these changes are considered normal and are also sometimes called pure or usual ageing. It is this universality that is part of the definition of normal ageing, because the changes that accompanies it are to be expected and are usually unavoidable (Besdine & Alpert, 2019).

In other words, ageing is said to be normal when it is not accompanied by diseases. It is a normal modification of the structure and functions of the organism resulting from the intriguing effect of genetic and environmental factors to which the organism has been subjected to throughout its life. These changes are heterogeneous among the elderly population. Progressive neural loss is physiological and explains the decline in certain abilities but is not correlated with a decline in performance.

1.1.3.2. Pathological ageing

Pathological ageing is characterized by the occurrence of illnesses which makes living difficult for the aged sick person. Everything changes for him, his body, social network etc. The aged person going through pathological ageing may live a life characterized by confusion, behaviour disorder, chronic illnesses, infections or even dementia (known as the continuous decline in thinking, behavioral and social skills that affects a person’s ability to function independently).

For Trivalle (2010), pathological ageing is that ageing characterized by different pathologies that accumulate with the passing of time and which often leads to dependency. It has effects on the daily life of the person going through it, since these pathologies necessitate care by daily medication in some cases. The third ager may need to be helped in taking his medicines and

in the accomplishment of his daily tasks. Both psychological and physical pathologies may require specialized care.

One of the most frequent pathologies in pathological ageing is dementia, specifically the Alzheimer disease (AD). Described as a progressive disease that destroys memory and other important mental functions through the degeneration and death of brain cells and their connections. The early sign of AD is forgetfulness, it impairs the thinking and reasoning capacity of the person; his capacity to make judgment and decisions, plan and perform familiar tasks, and it changes the personality and behavior of the concerned since the brain changes that occur in AD affects mood and behavior. Resulting in mood swings, delusions, depression, distrust, to name but a few.

Pathological ageing also corresponds to that state where the psychic and physical faculties of the person are no longer optimal, there could be one or several pathologies affecting the individual at the same time. As Chang et al. (2017) rightfully points out, “the progression to pathological processes in response to stimuli increases with ageing due to progressive changes in the structure and function of organs after maturation, resulting in a decrease in the ability to maintain functional reserve or homeostasis”.

In addition to the types of ageing, there are other concepts that describe how one can age or should age, they include: successful ageing, active ageing and productive ageing.

1.1.3.3. Successful ageing

Successful ageing has become an important concept to describe the quality of ageing. There is no single definition of successful ageing that satisfies everyone. Shetty et al. (2018) explain that, when age-related changes occur gradually, individuals achieve what is known as “successful ageing”, which according to them is a condition where older individuals in their sixties, seventies, and eighties show no significant disease or disability. But sustain very good or reasonable cognitive function and actively participate with life.

The concept developed from a biomedical approach to a wider understanding of social and psychological adaptation processes in later life. According to the classic concept of Rowe and Kahn (1997), successful ageing is defined as including three main components: low probability of disease and disease-related disabilities; high cognitive and physical functional capacity; and active

engagement with life. Hence, successful ageing is more than the absence of disease, and more than the maintenance of functional capacities. Although both are important components of successful ageing, it is their combination with active engagement with life that represents the concept of successful ageing most fully (p.433).

This concept equally involves intrinsic genetic factors and extrinsic lifestyle factors (such as diet, personal habits, exercise, psychosocial aspects) which should not be neglected for the sole focus on the genetic view of ageing say Rowe and Khan (1987).

Also, successful ageing can start in childhood as people develop habits and work ethics and learn to exercise and eat well (Castel, 2018). In accordance to this, Misha'l (2017) adds that remaining physically, cognitively, and socially active, with continuous generativity, are the main parameters of successful ageing. Lifestyle and behavioural measures, with specific designed age oriented medical care and specific devices wherever needed, are equally instrumental to achieving successful ageing.

We therefore understand that successful ageing implies ageing well, and ageing well implies in all individuals including third age persons, the preservation of good mental and physical capacities which will enable them be socially active and autonomous. To achieve this, individuals must make appropriate choices throughout their life-course as an assurance for well-being. The first success in ageing is first of all living long, followed by the decision to live a quality life, then adopting favorable eating and health habits. All these keeping in mind as per the Gerontological Society of America (2002) that, "It is not enough to add years to life, we must add life to years".

1.1.3.4. Active ageing

Active ageing is a concept that has currently been promoted by the WHO. It aims at encouraging the process of growing older without growing old, through the maintenance of physical, social and spiritual activities throughout a lifetime. The idea of "active ageing" has emerged as an attempt to bring together strongly compartmentalized policy areas in a coherent way. The WHO in 2002 published the document Active Ageing, a policy framework which defines this concept as "the process of optimizing opportunities for good health, participation and security in order to enhance quality of life in old age".

Active ageing highlights the need for action in multiple sectors, and aims to ensure that "older people remain a resource to their families, communities and the economy". The WHO policy framework identifies six key determinants of active aging, each one including several feature: behavioral determinants which comprises feeding, drinking, exercise or physical activities; personal determinants (biological/genetic, and psychological personalities); social determinants like education, social care, health and social services; economic determinants such as wages; and physical environment which may comprise safe housing, low pollution levels etc.

Paul et al. (2017) report on the key elements of active ageing according to the WHO's model: Autonomy, which is the perceived ability to control, cope with, and make decisions about how one lives on a day-to-day basis according to personal rules and preferences. Independence, which refers to the ability one has to perform functions related to daily living, for instance, the capability of living in the community with no or little help from others. Quality of life, and finally healthy life expectancy, which refers to how long people can expect to live in the absence of disability. The main pillars of the model being participation, health and security, with lifelong learning being recently added to the model as the fourth pillar.

In brief, active ageing includes participation in society and receiving protection, security and care (Walker, 2012, as cited by Wongsala et al., 2021)

1.1.3.5. Productive ageing

Productive ageing on it part is an umbrella concept covering the different types of activities that people engage in in old age. Old age here is seen as a productive period of life with older persons continuing to be engaged in different activities; contrary to theories that explained ageing as a period of physical decline, loss and passivity (Foster & Walker, 2015 as cited by Dommaraju & Wong, 2021). This concept (productive ageing) has been useful in promoting and optimizing employment opportunities at older ages through lowering of employment barriers, creation of part-time and flexible work, enhancing legal protection of older workers, and promoting non-economic activities to enhance the quality of life of older people (WHO, 2002; Clarke & Warren, 2007).

In the health domain, productive ageing has helped shape policies to support healthy and active life for the reduction of risks and the delay of physical and cognitive disabilities, and to improve functional capacities when there is a decline in intrinsic abilities (Rowe & Kahn, 1998). Dommaraju and Wong (2021) add that in addition to the economic and health domains to

productive ageing, this type of ageing is equally used in promoting stronger family and community ties to support older people, to boost their standing by valuing their contributions and respecting the roles they play in the society. Providing social and community opportunities for older people's participation, and involving them in the civil and political life of their society. Implying that this domain is not just about opportunities, but it is also about the creation of the rights of older people (the right to work, to dignity, to respect, and more).

Also, productive ageing is about building resilience and adaptability in older persons (Boudiny, 2013; Peng & Fei, 2013). Resilience is important for older people to cope with health and other forms of adversity by emphasizing the importance of accepting and adapting to changes, equipping older people with necessary resources to deal with adversity and to improve their well-being (Gergen & Gergen, 2011; Paúl et al., 2017).

There are varying forms of activities that are considered as productive ageing which range from the "production of goods and services whether paid or unpaid, formal or informal volunteering, caregiving, and those activities that develop the capacity for work" (Visaria & Dommaraju, 2019, p. 14). Peng & Fei, (2013); Morrow-Howell and Greenfield, (2016) focused primarily on four domains of productive ageing: the economic production mainly through work participation; family care which includes housework and caregiving; volunteering in community and social welfare activities, or informal volunteering through friends and acquaintances; and also lifelong learning whether formal and informal learning.

Productivity at older age is an important aspect that contributes to wellbeing of older persons. Keeping in mind however that the context, notion, and implication of productive ageing might not be same across different societies and cultures (Cosco, 2017; Martinson & Berridge, 2015), such that some of the assumptions behind productivity in the third age might be more applicable to certain types of societies and not others.

All in all, we retain that productive ageing can be applied to enhance health and well-being of older persons. The concept of productive aging can provide guidance in addressing certain situations, the assumptions of productive aging reflect today's reality that older people are archives of wisdom and experience and an important asset for society with the potential of maintaining that condition until late in life. They capable of making economic and social contributions that benefit themselves, their families, and their communities; as such, they are in need of purposeful and

meaningful roles and activities in life (Kerschner & Pegues, 1998). For, being productively engaged in any activity is associated with a variety of positive mental, physical health and well-being outcomes (Borsch-Supan et al., 2009; Gessa & Grundy, 2013). Productive ageing could potentially delay the onset of age-related illnesses, as Kaufman (1986) states, "older people are not considered "old" by their families and friends, nor do they think of themselves as old, so long as they remain active and productive in some meaningful sense."

1.1.4. THE THIRD AGE PERSON

Age is a social concept which determines the status of individuals in both life duration and in social life. It is therefore an important regulatory element in the society which gives social roles to individuals and determines the introduction of individuals to certain social activities (Victor, 2005, as cited by Gunder, 2013). Gunder (2013) explains that when handled sociologically, age is generally classified into 3 categories.

- Chronological age which is defined as the total number of years that the individual lives from birth (calendar age).
- Functional age, defined as the appearance of individuals and the activities which they are capable of doing. In other words, it is determined by the level of self-capacity of the elderly in daily activities.
- Subjective ageing which is defined as how old the person feels himself to be.

1.1.4.1.The difficulty to situate the third age person with chronological age

There is lack of agreement in scientific papers concerning the age at which one should be called "old" and what exactly are the years that constitutes the age bracket for the "third age". There is some agreement in the literature that old age begins from age 60 or 65, as determined by retirement measures, however, retirement ages differ between countries, for instance, according to degree No.2020/802 of 30 December 2020 to harmonize the retirement age of civil servants in Cameroon, retirement ages are 60 years for category "A" and "B" civil servants and 55years for categories "C" and "D" civil servants. Meanwhile in South Korea and Japan for instance, the average retirement ages for men according to the Organization for Economic Cooperation and

Development (OECD) are 72 and 70 years respectively. This, due to the growing number of people younger than 75 who were found to be still robust and active.

Aside from that, there is no uniformity in the ages suggested for old age throughout the literature. Ferry (2010) for instance distinguishes between the young-old who are aged between 55 and 70 years, the old, from 70 to 85 and the very old, above 90 years. While Alterovitz and Mendelsohn (2013) mention a classification wherein persons aged 65 - 75 years are termed "youngest-old", those between ages 75 and 85 years are "middle-old", and persons of 85 years and over are known as "oldest-old", which shades more light on the category and manner of approach of the elderly. Likewise, popular organizations are not harmonized in their considerations, for example, the WHO (2015) reports on the over 60s, 70s, and 80s, as does Age International (2015), while the UN (2015) indicates the old to be over 65 and the oldest-old to be over 85. These few examples show how policy documents on "older people" use different age division and terminologies (Kydd et al, 2020), making researchers works on ageing difficult.

1.1.4.2. Definitions of the "Third Age" and description of the third age person

More recently, the labels "third" and "fourth" age are being used as a way of linking ageing to functional status rather than chronological age (West & Glyns, 2014; Higgs & Gilleard, 2015), although there is many disagreement on the age that classifies the third age, it is usually defined as beginning from the calendar age of 65 years. This definition originates from the National Old-age Pension System of Bismarck by the German Chancellor at the end of the 19th century. In Germany at that time, which was socially unstable, the first attempt to implement a social security policy for receiving a pension was the age of 65 in order to calm workers' dissatisfaction, prevent the spread of communism, and achieve social cohesion (Chang et al., 2017), Marking the third age as an age of retirement.

In accordance to the above, Laslett (1996a) portrayed four distinct "ages" of a person's life course among which he described the third age. He represented the "First Age" as the period of dependency, the "Second Age" as the time of independence, employment and maturity, the "Third Age" as the period during which people are freed from work and family constraints and have time to pursue a good quality of life (an era of personal fulfillment), and he saw the "Fourth Age" as characterized by dependence and decline in health.

Weiss & Bass (2002, p.3) aligned to this but went further in their definition of the third age. They said it is that period in life when "there is no longer employment and child raising to seize time, and before morbidity enters to limit activity". They equally termed it the time of comparative independence marked by "freedom from the demands of earlier life, freedom from the need to earn a living, freedom from responsibilities for others (p. 4).

Combining these information, we understand that third age persons are older adults 65 years and above, usually not above 85 years old (age bracket: 60/65 to 75/80 years as per the Cambridge university press, 1991), who are now free to enjoy retirement, free from external pressures, and free to settle in for new adventures and personal fulfillment. In this study, we consider third age people those older adults male and females who have crossed the middle age but have not yet reached the oldest stage of old age, we consider persons aged from age 60 to age 79.

1.1.4.3. An African view of the third age person

Apart from age and the other various aspects characterizing the third age person as mentioned above, the third age person is equally considered a carrier of wisdom and knowledge as per the African point of view. Which he then transmits to his descendants and the society during this period of his life. Amadou Hampâté Bâ (1973) affirmed that "In Africa, when an old man dies, it is a library that burns", implying that third agers are persons full of experience, understanding, knowledge and wisdom. Most of them possess answers to questions and solutions to the many situations presented them. However, the third age person nowadays losses in a great way his potentials and skills due to cognitive/executive function declines as they age.

The third age people of the Bible, ancient literature or Greek mythology were regarded and are still regarded with very high esteem. They were wise, nobles, kings, prophets, experienced and highly respected. Unfortunately, nowadays the aged in our societies are being looked down, regarded as persons having nothing to offer anymore, neither to their families, nor to the society they live in. They are considered as people who have "done their time" as some youths say. All because of the great drain in mental capacities they go through.

The ageing of relatives is now scary especially when it is characterized by loss of executive abilities like mental flexibility, which puts adults in a state of dependence. This sometimes leads to the loss of unity and balance in families especially if pathologies like the Alzheimer disease (characterized by memory loss) takes hold of the adult. Whereas, when the ageing adult is still autonomous and capable of handling daily tasks like the fulfilment of various roles involving being a parent; a grand-parent; a sibling… there is equilibrium and both the family and the society benefits. Third age people still have enormous roles to play, among which the transmission of knowledge to younger generations, resolving conflict and maintaining social cohesion. There's need therefore for strategies that allow them naturally maintain or improve their functional states as they advance in age.

1.1.5. THE NEUROPSYCHOLOGY OF AGEING

Neuropsychology is that branch of psychology that is concerned with how individuals' cognition and behaviour are related to the brain and the rest of the nervous system. The "neuroscience" part aims at giving understanding on cerebral modifications that lead to cognitive function declines, while the "psychology" part leads to great advancements in the discovery of the evolutions linked to the ageing of mental processes (Dujardin and Lemaire, 2008).

For Moscovitch and Winocur, (2002), researches on the neuropsychology of ageing are concerned with changes in behaviour that are related to corresponding changes in the nervous system. In other words, an understanding of the neuropsychology of ageing explores the various knowledge on evolutions linked to ageing and cognitive functions, seeking to understand the impact that ageing has on the great cognitive functions of older adults.

The ageing population is constantly rising and most of the aged face declines of cognitive functions. It is therefore necessary to understand that which happens during this process so as to have more control, and do things right in anticipation. In this work we present two form of neuropsychology of ageing: the neuropsychology of normal ageing and the neuropsychology of pathological ageing. The former focuses on the normal subtle changes that comes with ageing such as older adult's difficulty to remember, think, focus... while the latter deals with those pathological changes that appear in old age such as dementia.

1.1.5.1.The neuropsychology of normal ageing

Some aspects of cognition remain relatively intact with normal ageing, they include implicit memory, vocabulary, and storage of general knowledge (Christensen et al., 1994), while the cognitive decline that typically accompanies normal cognitive ageing involves decreased efficiency in information processing in several areas, including speed of processing, reaction time, working memory capacity, short-term memory, executive control, and verbal fluency (Ravdin & Katze, 2013)

Dujardin and Lemaire (2008) explain that microscopic lesions common to aged brains or brains of patients such as neuronal loss (reduction in the number of neurons in certain parts of the brain); synaptic loss (depletion of synaptic connections); neurofibrillary loss (aggregation of neuron protein derivatives); and plates (the presence of intercellular deposits), observed on the brains of patients with neurodegenerative diseases such as dementia, Alzheimer, Parkinson, Lewy body disease can equally be observed in little quantities on the brains of elderly people not suffering from these illnesses (p. 12). However, these normal deterioration observed in normal ageing often leads to minor declines of cognitive functions at the level of attention, memory, reasoning and problem solving.

Attention as a cognitive function is our capacity to orientate mental resources towards information source. It enables the control of cognitive processes such as memorization, problem solving, to name but a few. As such, a drop in attention is followed by lots of negative consequences in the old person's life. Attention ages in two ways, the first aspect that ages is the capacity of selecting information from the environment (selective attention); and the second aspect that ages is the capacity to share mental resources between two information resources or two competing tasks (divided attention), (Dujardin and lemaire, 2008. p. 30**).** Functional neuro-imagery attempts to determine which brain zones are involved with attention deficit in third age persons are still going on, nevertheless the prefrontal and frontal lobes of the cerebral cortex are considered.

Cognitive declines touches many functions, as mentioned above, one of them is memory functions. The short term memory's function is maintaining in a temporally active manner a small amount of information during the accomplishment of diverse cognitive tasks, such as reasoning,

language task... This memory is often attacked by the Alzheimer disease, a defect in short term storing of verbal information as a result of the deterioration and death of brain cells. There are various types of memory that can be attacked, the episodic memory is that which enables the coding and retrieval of information linked to a given spatio-temporal context. Meaning the conscious recollection of a personal experience that contains information on what has happened, including where and when it happened. Studies on mild cognitive impairments and the episodic memory revealed both verbal and non-verbal recall deficit (Dujardin & Lemaire, 2008).

1.1.5.2.The neuropsychology of pathological ageing

Neurodegenerative infections or diseases such as the Alzheimer disease (AD) are those things that characterize pathological ageing. The AD is one of the causes of morbidity among third age persons. A neurodegenerative disease according to Dujardin and Lemaire, (2008), is an umbrella term for a range of conditions, which primarily affects the neurons in the human brain. These disorders are age-dependent, incurable and debilitating, resulting in progressive degeneration and death of nerves cells.

The AD is a form of dementia which is associated to neuropathological characteristics such as the gradual and progressive degeneration of the brain (cortical atrophy). It is expressed by a progressive and global deterioration of cognitive functions alongside the outbreak of emotional and behavioural disorders. The AD is characterized by a reduction of the weight of the brain with cortical atrophies. It brings along social and economic problems in the society, as the population of people with Alzheimer increases in a yearly basis. There is therefore need for better understanding of the sickness, for its quick and early detection, and eventual intervention (Dujardin and Lemaire, 2008).

The first clinical manifestations of ADs are typically seen as the disruption of short-term memories. With progression in the disease, there are typically more pronounced memory difficulties evidenced by misplacement of possessions, forgetfulness of appointments, repetitive conversations, and worsening ability to recall recent events. The clinical diagnosis of probable AD by the National Institute of Neurologic, Communicative Disorders and Stroke–AD and Related Disorders Association (NINCDS–ADRDA) criteria requires (a) memory impairment and

impairment in at least one other cognitive domain, (b) impairment in social and/or occupational function, and (c) ruling out any other possible causes of the dementia syndrome.

Neuropsychological assessment is recommended as a means of confirming the presence and quantifying the degree of different cognitive deficit. Typical presentations of AD with gradual onset of memory decline and progressive course are typically referred to as probable AD, while atypical presentations when other etiologies may affect cognitive impairment are generally referred to as possible AD (Ravdin & Katze, 2013). Researches on Alzheimer's disease show that even though the disease affects almost all cognitive functions like memory attention, language… these processes are not all altered systematically (Dujardin and Lemaire, 2008, p. 106).

Mild cognitive impairment (MCI) represents an intermediate zone of neurocognitive functioning that falls between normal age-appropriate functioning and dementia. In other words, it is the stage between the expected cognitive decline and the more serious decline of dementia. The original criteria for MCI proposed by Petersen et al. (1999) are as follow: Presence of a memory complaint; Normal activities of daily living; Normal general cognitive function; Abnormal memory for age; Not demented. These criteria are particularly useful for patients who have impairment in the memory domain but intact cognitive performance and functioning in all other domains. It is characterized by problems with memory, language, thinking or judgment. The stages of MCI from normal ageing to dementia are: from no cognitive impairment; to subjective cognitive impairment; to mild cognitive impairment and finally dementia.

In order to determine if a person has MCI there's need to evaluate cognitive functions, and this can be achieved by use of an objective neuropsychological test to check cognitive impairment. There is also difficulties distinguishing between normal ageing and MCI. However, it can be achieved through the use of very sophisticated tools that are clinically and theoretically valid, considering various complaints associated to psychological factors linked to cognitive impairment by patients. The various cognitive components being susceptible to be altered by MCI are among others the episodic memory, semantic memory, and executive functions (Ravdin, Katze, 2013).

1.1.6. MENTAL HANDICAP AND AGEING

"People with disability age like everyone else and even more than everyone else", says Gauthier (1996). The effects of aging, be it physical, psychological, functional are the results of the interaction between biological, psychological, social and cultural factors, with the changes accompanying ageing varying according to the individual. This is the same for mentally handicapped persons and handicap persons in general, as the changes in their ageing also vary depending on their psychologies, health status, and environment (Zribi, Sarfaty et al, (1996).

The terms handicap and mental handicap are not easy to define. Handicap for instance has no medical nor psychopathological basis, due to this, its definition has been broaden or reduced depending on social acceptance (Zribi, Sarfaty et al. (1996). UNICEF (1984) defined handicap as a disadvantage suffered by a subject as a result of an infirmity or a disability that prevents him/her from performing all or part of an otherwise normal function (taking into account age, gender, and various factors).

Philip Wood's definition which was later on adopted by the WHO (1975-1980) describes three processes that are involved in handicap: deficiencies, which are health-related disabilities defined as a loss of substance that can be located at the psychological, physiological and anatomical level. Incapacity, defined as the difficulty to realize a certain number of activity in one's daily life as a result of the deficiency. And disadvantage, which involves the difficulty to live a normal social life or have a good social integration.

Mental handicap (mental disability) on its part has been defined by the WHO as a stop in mental development or an incomplete mental development characterized by an insufficiency of faculties and overall level of intelligence, particularly in cognitive functions, language, motor skills and social performance. Therefore speaking of mental handicap, we understand that it puts emphasis on a lack or deterioration of cognitive capacities, a state of dependence, and intellectual disabilities as years come and go.

Knowing these leaves us wondering whether ageing causes handicap or whether ageing is a handicap in itself. Talpin and Talpin-Jarrige (2002) explain that from an official point of view, it has not been recognized in the modifications encountered during normal ageing that any of it

can be termed as a handicap. These two authors go further to emphasize that although the term handicap is often considered a social construction, which work hand in gloves with the construction of social norms regarding the physiological aspect of ageing, for example, the ageing and decline of masculine sexual capacities in certain societies like India is considered a new stage in the old man life, a stage calling him to turn to spiritual responsibilities. Meanwhile other societies like the Western societies would rather invent substances like the Viagra to remedy this situation which otherwise could be thought as a handicap. This rises up the desire to clarify that sicknesses, illnesses or diseases by themselves are not handicaps, and ageing it should be remembered is an evolution, or rather a progressive process of involution which may lead to more and more need for assistance at a certain age until death comes.

Mental disability has always been a problem in the society, as it affects every member of the family even though it might just be one member suffering from the disability. This is the same case for handicap in ageing, wherein it is not just the disabled who is affected, but the entire household. In the aged, the various signs and symptoms that accompany a disabling condition is often drop in intellectual capacities, loss of autonomy, reduction in interactions, dependence and limited opportunities. The United Nation's Department of Economic and Social Affairs, shares that over 15% of the worldwide population live with one or more disabling conditions, and more than 46% of older people aged 60 years and above have disabilities with over 250 million of them experiencing moderate to severe disability. This implies that, if not handled properly with the help of factors necessary for a successful and healthy ageing (good feeding, quality living, etc.), older people will be more and more at risk of disabilities.

1.1.7. BARRIERS TO HEALTHY AGEING

Longer life brings with it opportunities, not only for the aged and their families, but also for the society as a whole, and additional years provide the chance to pursue new activities such as further education, a new career, or a long-neglected passion says WHO (2021). Healthy ageing is defined as the process of developing and maintaining the functional ability that enables well-being in older age (WHO (2020). It includes survival to a specific age, being free of chronic diseases, autonomy in activities of daily living, wellbeing, good quality of life, high social

participation, only mild cognitive or functional impairment, and little or no disability (Fuchs et al, 2013).

The foundation of good ageing states Hermandez and Johnson (2017), is maintaining a healthy lifestyle (involving a consistent physical active routine) and a healthy diet, as this is particularly important for ageing adults to preserve their autonomy and independence. However, there are significant individual and environmental barriers that could reduce the ability of a person to maintain a healthy quality of life or engage in consistent lifestyle behavior. Some barriers to healthy ageing at the level of the individual are among others, financial issues, social isolation, lack of motivation, lack of education, while environmental barriers could include the immediate environment such as the availability or non-availability of social amenities.

Other barriers to healthy ageing could be the prevalence of diseases. The WHO affirms that common conditions observed in old age named geriatric syndromes includes hearing loss, cataracts, back pain, neck pain, diabetes, depression, dementia, which may stand as barriers to healthy ageing. Also, Frailty, described as a state of increased vulnerability (Kuh, 2007, cited in Fuchs et al, 2013) is another barrier to healthy ageing.

Another factor influencing healthy ageing according to the WHO is the physical and social environment. They can affect health in a direct way through barriers or incentives that affect opportunities, and health behavior. The maintenance of healthy behaviours throughout life, especially eating a balance diet, engaging in regular physical activities and dropping non-healthy habits such as smoking, high level of alcohol consumption. May improve overall mental capacities and reduce the risk of dependency

1.1.8. AGEING AND SELF-ESTEEM

The perception of one's old age or that of others is very variable and personal. Self-esteem is considered to be a relatively enduring characteristic that possesses both motivational and cognitive components (Kernis, 2003, cited in Ditzfeld & showers, 2013). It is related to better health, less criminal behavior, lower levels of depression and, overall, greater success in life. Bameister et al. (2003) say it is the positivity of a person’s global evaluation of self and one of the

most famous indicators of mental health. To maintain good mental health, it is important to have a positive view of the self to some extent (Ogihara & Kusumi, 2020).

According to Ogihara and Kusumi (2020), knowing the developmental trajectory of self-esteem as people age is important for two reasons. Firstly, knowing when self-evaluation tends to become negative over the lifespan, will facilitate effective prevention and provision. And secondly, knowing the period when self-esteem is at risk of turning negative can facilitate effective intervention and responses depending on the categories of age.

The thought that self-esteem rises steadily as people age but starts declining around the time of retirement is not very stable. This is explained in that, the midlife being the time of highly stable work, and family/romantic relationships, is characterized by peaks in achievement mastery and control over self and environment (Erikson, 1968). Also, adults who develop healthily learn to look inward for sources of positive self-esteem instead of constantly relying on external reinforcements. And if they maintain this manner of reasoning, the personality change occurring during adulthood would show a great growth in maturity and adjustment characterized by stability (Crocker & Wolf, 2001). This explains why some older adults may or may not maintain their self-esteem as a result of the various transition gone throughout the life course. However, for the third age person, maintaining a high self-esteem is of great importance.

1.1.8.1. Importance of self-esteem to third agers

Self-esteem is considered to be a relatively enduring characteristic that possesses both motivational and cognitive components (Kernis, 2003). Most individuals tend to show a desire for high levels of self-esteem and engage in a variety of strategies to maintain or enhance their feelings of self-worth. While individuals with different levels of self-esteem tend to adopt different strategies to regulate their feelings of self-worth, such that those with high self-esteem are more likely to focus their efforts on further increasing their feelings of self-worth (self-enhancement), contrary to those with low self-esteem who are primarily concerned with not losing the small self-esteem resources they already possess. Since it is self-esteem that brings strength and motivation in individuals to get into lifestyles with promising effects.

1.1.9. NUTRITION, LIFESTYLE AND AGEING

As mentioned previously, ageing is a continuous and irreversible process that begins in the mother's womb as a foetus and an embryo. A healthy biological ageing depends on a complex scheme of reactions, physiological and biochemical processes comprising: hereditary trait including genetic adaptations/modifications; and the influence of environmental factors, the most important of them being the individual's nutrition and lifestyle (Sgarbieri and Pacheco, 2017). Several researchers carrying out researches on the impact of nutrition and quality living on brain health in the aged and ageing have shown positive results, implying that healthy living and healthy eating leads to healthy ageing. Some of these researchers' findings are shared below.

Rowe and Khan (1987) for instance had affirmed many years ago that the age-related declines which defines normal ageing are due to modifiable factors like diet, personal habits, exercise and psychosocial factors. Thus, individuals may engage in lifestyle modifications to avoid diseases and consequently enhance their chance of ageing well. Implying that alterations that accompany ageing are neither linear nor constant, and they are only vaguely associated with a person's chronological age. That is why around us we can observe some people in their 70s enjoying good physical and mental functional abilities, while others are frail and require significant assistance to maintain their basic needs. Reason being that most of the mechanisms of ageing are strongly influenced by the individual's behaviors and environment.

For Vauzour et al. (2016), nutrients, non-nutrients, food components and whole diet impacts cognitive health and ageing. According to them, the growing preclinical and clinical research in healthy individuals at the early stage of cognitive decline has demonstrated the importance and benefit of nutrition on cognition in older adults or third age persons. They also found out that a variety of factors running from genetics, lifestyles, nutrition, disease, trauma, medicine influences the human cognitive functions and determines whether ageing would be normal or pathological. They demonstrated with evidence that age related declines in cognitive functions starts happening from age 20 through the adult lifespan with such declines occurring in all individuals regardless of your status.

1.1.9.1.The role of nutrition, lifestyle in third agers

The role of lifestyle interventions in cognitive decline is equally examined. The studies of Martin et al., (2006); and Mattson (2012), showed that destructive dietary habits like overfeeding, low antioxidant nutrients, and lifestyles are seen as being key environmental factors for either brain health or brain disorders during ageing. For this reason, many dietary components act positively in a preventive nutritional strategy for healthy brain and healthy ageing in general. Therefore, there is the necessity to increase research on nutrition and healthy eating benefits in order to identify the best dietary recommendation in human population. This will lead to the prevention and/or delay of diseases, disabilities and increase in quality of life in the elderly (Romanvinas and Serra-Mayem, 2014; as cited by Vauzour et al., 2016).

According to Vauzour et al., (2016) again, information on nutritional assessment for diseases prevention is important as it would provide scientific evidence for the role of dietary factors on human health and well-being, however, getting information on nutritional assessment is still a huge challenge due to the variability and heterogeneity of foods, and limited knowledge of most food composition. When thinking of identifying dietary approaches for the promotion of healthy brains, Vauzour et al. (2016) recommended a holistic approach, including nutrition, lifestyle factors and exercise.

In one accord with Vauzour et al. (2016), Ravding and Katze (2013) state with even more precision in relation to the prevention of cognitive declines in third age persons that there exist effective strategies to prevent cognitive decline in the context of normal ageing. Mild cognitive impairment (MCI), and dementias like the Alzheimer disease (AD) can be prevented in persons at risk of developing those through specific dietary changes rich in vegetables, fruits, fish and low in carbohydrates and saturated fat. They add that lifestyle such as regular physical exercise is among the best of all potential interventions against AD.

1.1.9.2. Malnutrition and undernutrition in the aged

Malnutrition can be understood as an impairment of health that is either caused from a deficiency, excess, or imbalance of nutrients. The Global Nutrition report (2017) claims that several nations face serious nutrition-related challenges especially Africans. Who still lack healthy amounts of food and nutrients needed to grow and develop, which greatly affects their overall

well-being. Since proper nutrition is very essential for optimal brain development and function in both adolescent and older adults (Eloff, 2019).

Early nutritional wellbeing is important and its importance is emphasized through the impact of malnutrition and undernutrition throughout childhood and even in adulthood. The prevalence of undernutrition is a problem in low income countries which in turn provides an issue at the level of nutrition and cognitive function. The study of Black et al. (2008) show how there is a significant impact of malnutrition on brain development and cognitive abilities. Changes in eating habits which accompany major lifestyle changes such as loss of independence and difficulties with activities of daily living, including shopping and meal preparation among the elderly makes them particularly vulnerable to nutritional deficiency. With respect to "pathological ageing", a sufficient supply of key nutrients (e.g. omega-3 fatty acid and the B vitamins) may be able to prevent, or at least delay the onset of dementia (Riby, 2012).

Concerning health more generally, the World Health Organization has emphasized an urgent need to consider malnutrition (2011) and undernutrition (2017) among the elderly 60 years and over, and that the daily allowance of certain nutrients should be considered, so as to prevent premature mortality, poor quality of life and reduced functional ability. For, there exist a strong association between undernutrition and subsequent mortality in older people (Dent et al, 2012, cited in WHO, 2017).

1.1.10. AGEING AND HEALTH

Good health is vital in the maintenance of an acceptable quality of life in older individuals so as to ensure the continuation of third age persons' contribution in the society. WHO defines health as a "state of complete physical, mental, and social well-being and not merely the absence of diseases, or infirmity" (WHO, 1999), and it goes further to define healthy ageing as "developing and maintaining the functional ability that enables well-being in older age". The functional abilities of persons are determined by three things: their intrinsic capacity (i.e. physical and mental capacities); the environment in which they live (including physical, social and policy environments); and the interactions among them (WHO, 2022).

The health status of an elderly person is usually the result of the effects of aging and the additive effects of past, current, chronic or acute diseases. For instance, cell damage caused by

oxidative stress is one of the important mechanism of ageing according to Chang et al., (2017). Although some of the differences in health status among older adults are genetic, most are explained by the physical and social environment, and personal characteristics, as per the WHO. The environment in which the child or adult lives, or even the environment in which the foetus develops, coupled with personal characteristics, has long-term effects on how that person will age. Physical and social environments can affect health either directly or through barriers or incentives that influence health opportunities, decisions, and behaviors.

Maintaining healthy behaviours throughout life, particularly eating a balanced diet, engaging in regular physical activity, and maintaining a quality life helps to reduce the risk of non-communicable diseases, improve physical and mental abilities, and delay dependence on care (WHO, 2022).

Older adults also make a wide variety of contributions to their families and communities, as living longer open up opportunities, not just for third age persons and their families, but equally for the society. Nevertheless, the extent of these opportunities and contributions is largely dependent on one factor: health. If people live these extra years in good health and in a supportive environment, their ability to do what they enjoy will be quite similar to that of younger people.

In consideration to the importance of health in ageing in general, and to the third age person in particular, the United Nations General Assembly has declared the years 2021-2030 the Decade of Healthy Ageing, which is a global collaboration bringing together governments, civil society, international institutions, professionals, academia, the media and the private sector to take concerted, mobilizing and collaborative action over 10 years in support of longer and healthier lives with aims of reducing health inequities and improving the lives of older adults, their families, and their communities.

And, according to Université Medical Virtuelle Francophone (2011), a good knowledge of normal ageing is essential for distinguishing between the effects of aging from those of diseases. Wrongly attributing certain symptoms of diseases to be the effects of normal ageing leads to the misunderstanding of health problems and to neglecting their management and treatment.

To conclude, we understand that ageing is a continuous and unavoidable process of lifelong modifications in the physical, social, and psychological functioning of the human being. The changes that occur with ageing are influenced by aspects from the environment in accordance to Bronfenbrenner's ecological systems theory which posits that the environment has a great role to play on the individual's development. As such, they can be improved through quality behaviours, quality lifestyle and quality diet. This does not exempt changes at the level of cognition and executive functions, such as cognitive flexibility. The paragraphs that follow will throw more light on what cognitive flexibility is, and the aspects attached to it as an individual ages.

1.2. COGNITIVE FLEXIBILITY

Cognitive flexibility (CF) is the readiness with which one can selectively switch between mental processes to generate appropriate behavioral responses. It enables an individual to work efficiently, to disengage from previous tasks, reconfigure a response set, and implement this new response set to the task at hand (Dajani & Uddin, 2015). Clément (2022), defines cognitive flexibility as that which allows us to adapt to a constantly changing environment, to discover solutions in new and/or unexpected situations, to transfer knowledge learned in one context to a new context, to select the relevant stimuli in the environment to achieve a goal, to switch our attention from one stimulus to another according to the constraints of the situation, to alternate between two possible forms of processing stimuli, and to change our representation of the goal we are pursuing. And greater cognitive flexibility is associated with favorable outcomes throughout the lifespan, for instance cognitive flexibility enables better abilities in the reading abilities of children; higher resilience to negative life events and stress in adulthood; higher levels of creativity in adulthood; and better quality of life in older and third age individuals (Davis et al., 2010).

1.2.1. Generalities on cognitive flexibility

1.2.1.1. Cognitive flexibility as an executive Function

Executive functions (EFs) is an umbrella term for functions such as planning, working memory, inhibition, cognitive or mental flexibility, as well as the initiation and monitoring of action (Chan et al., 2007). In other words it encompasses several cognitive processes that are directed in complex goal-directed activities. It represents a number of mental processes which allows individuals to use thoughts to govern behavior and to perform complex activities involving organizing, strategizing, controlling, and sustaining attention and self-management. To Baron (2004), "Executive

functioning skills allows an individual to perceive stimuli from his or her environment, respond adaptively, flexibly change direction, anticipate future goals, consider consequences, and respond in an integrated or commonsense way." (p. 135)

Clement (2022) explains that the term "executive function" (EF) initially referred to a set of symptoms observed in frontal injured patients, like the inability to inhibit; to mentally represent a plan; act in a directed, autonomous, and flexible manner when faced with various situations. Clement adds that these executive functions refer to different abilities involved in new or complex situations like the ability to maintain information in working memory and to manipulate information relevant to action in progress, the ability to resist a dominant learned behavior or response, to maintain attentional focus on a specific task or strategy, to ignore distracting or non-pertinent information, as well as to switch from one strategy to another, or from one task to another depending on the constrains of the task.

Miyake et al. (2000), on their part identified three basic executive functions on a sample of young adults, which were: inhibition, updating in working memory and flexibility. Inhibition is the function involved in the suppression of irrelevant dominant response in favour of another response, or in an absence of response. Working memory retrieval corresponds to the ability to manipulate and temporarily maintain certain information relevant to the task in hand in the working memory. And flexibility allows the individual to change their behavior in order to adapt to changes in the environment. With flexibility, the individual can switch from one strategy to another or from one task to another. These main or central EFs, were later on combined in development to enable an even higher level that includes planning, problem solving, decision making, and reasoning (Richards et al., 2019).

1.2.1.2. Definitions of cognitive flexibility (Mental flexibility)

Flexibility has been considered one of the three main executive functions allowing the exercise of cognitive control, along with inhibition and updating in working memory. In adults, these three functions are partially independent (Miyake et al. 2000). Cognitive flexibility allows one to adapt to a constantly changing environment, discover solution in new or unexpected situations, transfer knowledge learned in a context, select relevant stimuli in the environment, achieve a goal, switch attention from one stimulus to another according to constraints of the

situation, alternate between two possible forms of processing stimuli, and to exchange representations of the goal we are pursuing (Clement, 2022).

To Ionescu (2011), Cognitive flexibility is an important characteristic that helps humans pursue complex tasks, such as multitasking and finding novel, adaptable solutions to changing demands. He explains that it is still a poorly understood construct and proposes a unified account that considers cognitive flexibility a property of the cognitive system, rather than a cognitive skill. He emphasizes that the emergence of cognitive flexibility is dependent on two kinds of interactions: the interaction of several cognitive mechanisms, and the interaction of sensorimotor mechanisms, cognition, and context in developmental time. The quest for a comprehensive and unified account of cognitive flexibility is highly justified given its potential usefulness in fostering efficient problem solving and creativity, says Ionescu (2011).

To him again, Flexibility is considered a hallmark of human cognition and intelligent behavior. There are several behaviors that are considered flexible (e.g., multitasking, novelty generation, flexible problem solving), and it is difficult to single out any one as prototypically flexible. Cognitive flexibility can be understood in multiple ways. Some see it as a specific cognitive ability or skill most often set-shifting while others view it as a property of various cognitive processes or of the cognitive system (Ionescu, 2011).

Canas et al. (2003) defined CF as the human ability to adapt the cognitive processing strategies to face new and unexpected conditions in the environment. Through this definition, they brought forth three important characteristics of the concept namely: cognitive flexibility as an ability; an adaptation of cognitive processing strategies; and a task performance (Canas et al. 2006). The first characteristic suggests that cognitive flexibility can be seen as an ability, meaning, it is a process of learning that can be acquired with experience. The next suggests that cognitive flexibility involves the adaptation of cognitive processing strategies. Strategies here implies a sequence of operations which search through a problem (Payne et al. 1993, as cited by Canas et al. 2006). Hence, cognitive flexibility refers to change in complex behaviour, rather than just some responses. And the third characteristic suggests that it is only after a person has been carrying out a task that adaptation to unexpected changes in the environment may occur.

Another definition of Cognitive flexibility refers to a person's (a) awareness that in any given situation there are options and alternatives available, (b) willingness to be flexible and adapt

to the situation, and (c) self-efficacy in being flexible. In any given situation, a person has a choice about how to behave (Martin & Rubin, 1995).

According to Payne et al. (1993), as cited by Canas et al. (2006), flexibility can be seen as an adaptive capacity of individuals, even though this adaptation does not always happen. Leading therefore to cognitive inflexibility which is the failure of a person to deal with changes in the environment. In their book The Adaptative Decision Maker (1993), Payne et al. explain the processes of decision making, and present a framework for understanding how people adapt their strategies for solving decision problems in accordance to the task's demands they face. They emphasize the goal of attaining decision accuracy and minimizing cognitive efforts, and they argue that "the specific strategies used in solving particular decision problem are usually intelligent responses under the assumptions that people have multiple goals for decisions, including both the desire to be accurate and the desire to conserve limited cognitive responses" (Payne & al. 1993). They simply mean that people usually select strategies that are appropriate to circumstances when it comes to taking decisions regarding decision problems.

The works of Spiro and Jehng (1990), as cited by Canas et al. (2006) on its part presents a cognitive flexibility theory that explains that people who are able to make representations of tasks from several perspective can also easily interpret environmental changes and hence, can be more cognitively flexible. Their theory mainly aims at portraying aspects of general 'theoretical' orientation in knowledge acquisition and its application in complex domains. Explanatory hypotheses for cognitive flexibility have been brought up from works done by many researchers on cognitive flexibility and cognitive inflexibility. Cognitive flexibility has been as a result explained based on attentional processes on the one hand, and knowledge representation on the other hand.

Firstly, cognitive flexibility depends on attentional processes. This means that attentional control is needed for a person to assess a new situation and plan actions that addresses the new task. It equally means attention is necessary because of the changing nature and conditions of the environment leading to demands in regular focus for proper adaptation and proper task performance whether complex or not. Secondly, cognitive flexibility refers to how individuals represent their knowledge in regards to a task and the various attempts in dealing with it. Knowledge obtained through learning and modified in order to interpret and meet new task

demands, because human behaviour is ruled by the knowledge people have of their environmental parameters' values.

All in all, it seems that the concept of flexibility has not been easy to define. While the concept seems intuitive, cognitive flexibility shows itself in a broad spectrum of behaviors and lacks a unified definition. However, it is understood through the above definitions that cognitive flexibility is the individual's ability to adapt to changes in the environment. In this study, we will consider cognitive flexibility in older adults as their ability to continuously adapt to the changes occurring in them and around them, enabling them to maintain their autonomy and independence through flexible abilities, to keep playing their roles such as parents, grand-parents (for those with families) through the transmission of knowledge and counsel, and be able to flexibly care for themselves, such that they may require only very little assistance when and where necessary.

1.2.1.3. Concepts related to cognitive flexibility and cognitive inflexibility

The authors Canas et al. (2006) in their study equally present certain phenomena derived from studies in the psychology of thinking that are related to the concept of cognitive flexibility and cognitive inflexibility. There are four of them: cognitive blockade, cognitive hysteresis, functional fixation and functional reduction.

Cognitive blockade is the tendency to continue with an initial task even when it seems right to change or switch to alternative courses of action. Here, the person is limited to only part of the activities they are carrying out, hence are limited in time distribution. The phenomenon of cognitive blockade is related to cognitive inflexibility in that, in cognitive inflexibility, the individual keeps applying strategies that once worked for a task on other tasks even when there is need for change of action. Making cognitive inflexibility a form of cognitive blockade.

Next, there is the phenomena of cognitive hysteresis, also called tunnel vision or cognitive narrowing. It is defined as the tendency to adhere to a decision after evidence has proven it to be a mistake. It is considered a failure in the reevaluation of situations after decisions or action-taking has been made. Cognitive hysteresis is another phenomenon related to cognitive inflexibility.

The phenomenon of functional fixation is another phenomenon of cognitive flexibility and inflexibility. It is defined as the tendency to consider only the available objects in a task as known in terms of its more common function. It refers to having fixed perceptions of objects in the environment, not considering the different forms or new ways they can turn into or used. This

phenomenon like the others is also related to cognitive inflexibility, however, it differs a little bit from cognitive inflexibility in that to overcome it, one needs to find a new function for the object being used, whereas, in cognitive inflexibility, the same element is used with the same function but different strategies.

Finally, there is the phenomenon of functional reduction, defined as the tendency to face problem sticking to a single cause whilst neglecting all the other possible influencing variables. Modalities of functional reductions are among others, the reduction of different causes of a problem to one single problem, which in this case produces similar effects to cognitive inflexibility.

1.2.1.4. Neuropsychological basis of cognitive flexibility

According to Canas et al, (2006), the prefrontal cortex and its circuitry have been proposed as the neuropsychological bases of cognitive flexibility. It was found that the frontal lobe appears to mainly mediate a concrete form of cognitive flexibility known as spontaneous flexibility, a concept more related to the production of diverse ideas and to the access of knowledge systems with novel strategies distinct from most common semantic linkages (related to the representational hypothesis). While the corticostriate system which comprises the basal ganglia and their connections, and the frontal lobe mediates reactive flexibility (related to the attentional hypothesis). Hence, neuropsychological research supports the two explicative hypotheses of flexibility phenomena since the brain regions that are involved with attentional shifting and knowledge systems mediate different forms of cognitive flexibility task.

1.2.2. COGNITIVE FLEXIBILITY IN NORMAL AGEING

There are a multitude of changes in brain activities related with normal ageing in physically and cognitively sound older people. Ageing is known to cause neuroanatomical and physiological changes that affect cognitive processing in areas such as memory, attention, and executive functions (Ballesteros et al., 2015), with cognitive flexibility (CF) not being exempted. For example, regarding CF functioning in advanced age, research on performance in the Wisconsin Card Sorting Task (which requires individuals to adapt to new rules) found a significant increase in the number of errors and perseverative responses, together with a decrease in the number of completed categories, among older adults compared to younger participants (Axelrod & Henry, 1992; Daigneault, Braun, & Whitaker, 1992, cited in Richard's et al, 2019). Which shows that

cognitive flexibility declines with age, and often results in an inability to adapt to new situations and changes in the environment.

1.2.3. IMPORTANCE OF COGNITIVE FLEXIBILITY TO THIRD AGE PERSONS

It is due to the flexible nature of human cognition that individuals are capable of modifying their knowledge and habits in order to adapt to situations which they may face as they evolve or age. Cegala (1981) enumerates a number of roles that mental flexibility provides to the aged and young person. He says it increases attentiveness which benefits social interactions. It increases the level of assertiveness and responsiveness in social setting (Martin and Anderson, 1998) and eases adaptation to the social environment and by so doing boosts self-confidence.

Cognitive control is crucial too for goal directed behaviour under changing and less structured conditions (Lezak, 1982), so its decline leads to less effective adaptation. Among cognitive control functions, task witching that is responsible for cognitive flexibility may especially be affected by ageing. (Velichkovsky et al., 2019).

To Clément (2020), the specificity of human cognition allows for the activation and flexible communication of representations in a wide range of activities (for example, understanding a metaphor, being moved when reading a poem, using an object in a non-usual manner, solving a problem, inferring and understanding the meaning of a new word, or to a new work environment.

Cognitive flexibility plays a key role in the development of thought, reasoning and the acquisition of new knowledge. It is also useful in the mediation of social interactions, the sharing of points of view and the elaboration of socially coordinated action plans. In brief it is fundamentally involved in accommodating the environment in which we evolve and in adapting to the predictable or unpredictable circumstances encountered by individuals.

Cognitive flexibility equally allows for solution discovery, transfer of learning in older adults. It is important in many fundamental areas of cognitive development, whether in the acquisition of theories of the mind (Müller et al. 2005), or language (Deák 2003).

Finally, according to Miyake et al. (2000), flexibility has been considered one of the three main executive functions allowing the exercise of cognitive control, along with inhibition and ‘updating in working memory’. These three functions being partially independent in third agers.

In summary, this chapter aimed at throwing light on the concepts of ageing and cognitive flexibility as understood by the literature and as applied in this study in relation to the third age population and in relation to the context in which this study is carried out. We have seen that the mechanism of ageing is not easy to explain in a way that everyone will agree with, however, it is agreed that ageing is influenced by both biological and environmental factors. And therefore can be positively modified through appropriate means like diet and quality lifestyles factors, and so does cognitive flexibility. Implying that effectiveness in the two concepts brought up in this chapter necessitates the maintenance of quality dietary behaviours, or modifying the behaviours in view of practicing a quality of life lifestyle. In the next chapter, the concept quality of life is brought up alongside some theoretical reference models in support of quality behaviour for overall mental health, specifically flexibility for third agers.

CHAPTER 2:
QUALITY OF LIFE

The word “quality” refers to that which makes a particular object what it is, it reflects its identity whereas “life” is considered as the state of existence. This chapter has as aim to present the concept of quality of life, the dietary aspects of quality of life (which we term in this study “quality of life through feeding”), and its impact on third age persons flexibility. We proceed in this work with some definitions to the concept; its history; health-related quality of life; factors or determinants of quality of life, quality feeding and cognitive flexibility, to name but a few.

2.1. DEFINITIONS OF QUALITY OF LIFE

Quality of life (QoL) is a complex, multifaceted and multidimensional construct that requires multiple approaches from different theoretical angles. Its multidimensional nature has been argued to take into consideration the subjective nature of an individual, making it difficult to define. However, it is said to emphasize on the self-perception of an individual’s state of mind (Bonomi et al., 2000).

It aims at promoting and enhancing the life quality of individuals, families or inhabitants of a village, town, region, state, nation, and the world at large by reducing detrimental conditions or circumstances over a given time. QoL does not remain the same throughout a person’s life, rather it varies from one stage of the lifespan to another and from one type of spatial unit to another because every aspect of the life of a person is always influenced by the environment (Sinha, 2019).

The World Health Organization (WHO, 1976), defined quality of life as “an individual’s perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. It is also the “combination of the effects of a complete range of factors such as those determining health, happiness (including comforts in the physical environment and a satisfying occupation), education, social and intellectual attainments, freedom of action, justice, freedom of operation” (p.312). In 1995, the WHO upgraded their definition, explaining that QoL is a broad ranging concept incorporating in

a complex way the person's physical health, psychological state, level of independence, social relationships, personal beliefs, and their relationships to salient features of the environment."

Wenger et al. (1984) consider QoL as "an individual's perceptions of his or her functioning and well-being in different domains of life". Their definition takes into consideration what patients think about their internal state, as well as their relationship with other people.

To Diener et al. (1999) quality of life in a broad sense looks at how individuals measure the "goodness" of multiple aspects of their lives. Evaluations which include one's emotional reactions to life occurrences, disposition, sense of life fulfillment and satisfaction with work and personal relationships.

It can therefore be summarized from the above that Quality of life is a two-dimensional entity. The internal dimensions which are characterized by how the person feels good about himself and the external dimension, how the person feels good about others, as per Cai et al. (2021). Cai and his colleagues in addition to the various definitions of QoL emphasized the importance of the consideration of various cross-cultural and religious dimensions in the definition of this concept, as several factors affecting QoL are affected by the surrounding environment as well. This matches the core idea of theories of Bronfenbrenner and of Bandura who both emphasize the role of the external world, or the environment on the several aspects related to the individual.

2.2. HISTORY OF THE DEVELOPMENT OF QUALITY OF LIFE

References that bring forth elements of the birth of the term "Quality of Life" can be traced as far back to the 384-322 BC in Aristotle's Nichomachean Ethics. He conceives "the good life" or "doing well" to be the same thing as "being happy". But happiness, he explained, is a term that brings argument. When a man falls sick he thinks happiness is health, when he is poor happiness to him is wealth. Therefore, according to Aristotle, "quality of life" means different things to different people, even though the term "Quality of Life" only came to existence proper in the twentieth century.

It is suspected that the first person to use the term quality of life in the history of its development is James Seth. He mentioned it in his work while discussing the nature of ethical standard as social welfare. He stated: "in order for an ethical theory, we must not regard the mere quantity, but also the quality, of "life" which forms the moral end" (Seth, 1889, p.43). By so doing,

showing the importance of considering both the “quantity” and “quality” of life when promoting welfare activities to enhance happiness in individuals.

The idea of quality of life was considered to be first used after the Second World War and became popular with its spread through a range of Medias from television, and magazine advertisement to political speeches newspaper headline. The late 1960s saw a major shift from the objective indicators to subjective indicators such as ‘personal freedom, leisure, emotion, enjoyment and personal caring (Meeberg, 1993; Farquhar, 1995). Quality of life became commonly used in speech and in research on social and medical science subjects like psychology, sociology, nursing. Farquhar (1995), also mentioned that from the mid-1970s the term “clinical interventions” concerning health was equally used in the field of medical science along with the increasing importance and use of quality of life in social science. But, in fact, medicine and nursing science focused mainly on quality of life related to health to examine only one domain of quality of life, that is, physical functioning.

Later, Forward (2003, p. 5) admitting that the term began with Aristotle, stated that the concept of quality of life is not the exclusive result of the twentieth century but that it has a link to the historic idea of Aristotle (384–322 BC) when he used the terms ‘the good life’ and ‘living well’. He further noted that the scholars working in the field of quality of life between 1950 and 2000 gave more emphasis on the qualitative attributes of subjective categories such as “health, education, personal freedom, enjoyment and welfare” in defining the concept of a happy and good life, rather than the quantitative or material indicators of quality of life. This caused more interest among the scholars to work in the field of quality of life. As a result, Denmark, Canada and United Kingdom established several research centers with a view to study the quality of life of their people.

In addition to this, the World Bank, World Health Organization and the United Nations also worked and contributed a lot for the enhancement of quality of life of people globally. In the domain of health, QoL emerged in the 1970s as an important new outcome for health care in relation to “solving” major social and medical problems and dilemmas. In those years, new technologies raised new questions for clinicians so that they turned to using QoL as a parameter for making decisions in health issues. Consequently, researchers’ interest became the testing of instruments designed to measure health and QoL (Pinnacchini et al (2011).

The chronological arrangement of quality of life shows that it was Seth (1889) who first formally used the term “Quality of Life”. It also shows how medical researchers and scientists have taken more interest in the study of quality of life, explaining the dominance of scholarly literature on quality of life. Towards the end of the twentieth century, there was greater attention on the status of health rather than simply quality of life. As a result, many researchers in the field of medical and nursing science gave much more emphasis on “health-related quality of life” as against the term “quality of life”. But now in modern time, the study of quality of life has become interdisciplinary and has spread to science, medical science, technology, social science, environmental science, etc. More specifically, the study on quality of life is being carried on in economics, geography, sociology, philosophy, psychology, anthropology, environmental studies, home science, social work, social policy and in different subjects of medical and nursing science (Sinha, 2019).

It is therefore seen that the concept Quality of life has evolved and is now related to the patient’s well-being. It also focuses more on people’s subjective perceptions of the various aspects of their lives, not just the objective and measurable entities. Therefore, therapeutic perspectives should be done with regards to the subjectivity of each person. For, as mentioned by Cai et al. (2021), although there have been considerable improvement in the medical field such that there is improvement in life expectancy, it has not been linked to an improvement in quality of life. Physicians no longer just want the absence of sickness and death in their patients young or old, but life with vibrant quality that will be associated to vigorous youth and ageing (Elkington, in the annuals of internal Medicine, as cited by Cai & al. 2021).

2.3. HEALTH-RELATED QUALITY OF LIFE

Health-related quality of life arose as a result of medical researchers’ and scientists’ interest in the study of quality of life, explaining the dominance of scholarly literature on quality of life in the medical science field, where they used quality of life as an instrument in measuring health, disease and illness. By the end of the twentieth century, greater attention was therefore laid on the status of health rather than on quality of life simply. Which explains the emphasis on “health-related quality of life” against the term “quality of life”.

Health is understood according to the WHO (1948) as a state of complete physical, mental and social well-being, and not just the absence of disease and infirmity. This implies that an effective measure of an individual's health requires that the entire person be the focal point.

According to the Youth Health Education (2018), the exclusive representation of a person's overall health should include: physical health, expressed as what has, can and will affect the physical body, such as genetics, diet, illness and disability. Social health, defined as every type of social interaction with the potential of influencing either directly or indirectly (family, friends, colleagues…). Cognitive health, involves multiple factors that when combined can create intelligence and are necessary for the development and maintenance of independence. Emotional health, which involves the capacity of experiencing a vast variety of emotion both positive and negative. Cultural health, a combination of social and physical health as influenced by community laws, beliefs, values and having the potential to influence social, physical and emotional health. Spiritual health, usually including the belief of unity with a greater force, a supreme being involved in hope, purpose, faith and peace. And environmental health, which focuses on the relationship a person has with his environment (WHO, 2018).

Health-related quality of life (HRQoL) is an evaluation of quality of life and its relationship with health, as such, it is defined as "how well persons function in their life and their perceived well-being in physical, mental, and social domains of health". In other words Quality of life is an all-inclusive concept incorporating all factors that impact upon an individual's life whereas health-related quality of life includes only those factors that are part of an individual's health, since it is concerned with health-related aspects. HRQoL can be divided into three principal components: physical health which comprises general health, daily functioning, physical disability; mental health such as self-esteem, mood, perception of well-being, perceived stigma; and social health like relationship and social activities (Lehrner et al., 1999)

There are two things diseases may cause, it shorten life expectancy; or cause dysfunctions and symptoms that leads to disabilities in a person's performance of his daily activities. Health-related quality of life as mentioned above is therefore one of the quantitative measures used to assess the level of an individual's wellness. Making it a very practical concept when dealing with persons of the third age range and above.

2.3.1. Difference between quality of life and health-related quality of life

Quality of life is an extremely subjective value and it depends to a large extent on mental state, personality traits, preferences, value system etc. The terms Quality of life (QoL) and health -related quality of life (HRQoL) have often been used interchangeably (Elkinton, 1966, cited in Karimi, 2016). Even in the 1980s says Spitzer (1986), there have been concern that both terms were been used interchangeably. It is still the case nowadays (Karimi, 2016). Even at the level of the literature, there is still some confusion at this level, however, the fact that the use of the term quality of life preceded the use of Health related quality of life stands.

Quality of life was already discussed in the medical literature in the 1960s and it became more important in health care as medical treatment became able to extend length of life or life expectancy sometimes by means of Qol or the improvement of quality of life without extending length of life. The simple difference that can be made between these two terms is as Torrance (1987, as cited in Karimi, 2016) points out: "Quality of life is an all-inclusive concept incorporating all factors that impacts upon an individual's life, while Health-related quality of life includes only those factors that are part of an individual's health." This implies in order words that the non-health aspects of Qol which may include among others social and economic circumstances would not be included in health-related quality of life.

This therefore acknowledges that quality of life is more than health status, clinical symptoms, or functional abilities because health is just one dimension of quality of life (Ferrans, 1990, cited by Karimi, 2016). So health is a factor of QoL among other factors, and this health status only explains a small part of life satisfaction unlike in health related quality of life (Michalos, 2004 cited in Karimi, 2016). In brief, health-related quality of life is that aspect of quality of life that is most affected by ill-health.

2.3.2. Measurement of quality of life

Lord Kelvin (as quoted in Cai et al. 2021) said "what is not defined cannot be measured. What is not measured cannot be improved. What is not improved is always degraded". Hence, emphasizing the need for the measurement of QoL so as to see the effectiveness of treatment in the case of health-related quality of life (Cai et al, 2021).

As a result of the expansion of the concept of QoL and the raising interest for QoL in various clinical practices and researches, there is a need for reproducible and accurate

measurement tools. For Cai et al. (2021), another reason for quality of life assessments besides the numerous existing reasons is the comparison study treatment which calls for the identification of QoL aspects that may be affected by the therapy. Cai and his colleagues explain that quality of life is not directly measurable and so needs to be translated to indicators of its constituents and domains to be quantified. Nowadays we have hundreds of QoL measures. There are generic measures, which are applicable to most people, even to the healthy; and there are specific tools for QoL measurement in people with specific clinical conditions.

These instruments measure physical impairment, disability or handicap (better called measures of health status) because they focus on physical symptoms. There are various scientific tools applied to assess the QoL among people, each one emphasizes certain aspects. Some or few of the more recent instruments have scales that examine subjective non-physical aspects of QoL which they strongly emphasize on, like emotional, social and existential issues. Some examples of QoL measures are the Nottingham Health Profile (NHP), the Sickness Impact Profile (SIP), and the 36-item Short Form Health Survey (SF-36). These measures cover a wide range of aspects of life that can be adversely affected by ill-health, such as physical functioning, emotional well-being, and ability to undertake work and social activities.

The Sickness Impact Profile (SIP) of Bergner et al. (1981), is a measure to perceive health status as measured by its impact upon behaviour. In other words, it is a generic measure of change in behavior as a result of illness health-related quality of life. It measures the level of independence in performing daily living activities. It consists of 136 items that describe the activities of daily living, divided into twelve categories (sleep, rest, eating work, home management, recreation and pastimes, ambulation, mobility, body care, movement, social interaction, alertness behavior, emotional behavior and communication), and takes about 20-30 minutes to complete. Items describe every day activities, it can either be interviewed or self-administered. It is designed for the assessment of new treatments and for evaluating health levels in the population.

Nottingham Health Profile (NHP) of Hunt et al. (1981), which measures emotional, social and physical distress, is a generic measure designed to reflect lay perceptions of health status in opposition to professional definition of health (Nawito et al. 2017). The NHP is used to measure health problems as perceived by the patient and to assess the effect of the problems on daily functioning. It also has been proved to correlate strongly with other tools, thus showing good

repeatability and reliability (Chmaj-Wierzchowska et al, 2020). Nawito and colleagues further explain that the outcomes it provides are multiple and may be useful to clinicians and researchers who are attempting a measurement of the different effects of a condition or its treatment on various HRQoL domains.

Medical Outcomes Study (MOS) Short-Form Health Survey (SF-36) by Ware et al (1993), evaluates general health status and intended to fill the gap between lengthy questionnaires. It is a generic measure of eight domains of general physical and mental health (Ware and Sherbourne, 1992 as cited in Yang et al. 2012). Uses of the instrument include: assessment of patients in a clinical practice setting: differentiating treatment effects in a research study; and describing the general health of populations (Ware, 2000). As such, SF-36 is currently the most widely used general health assessment survey in the world, and has been translate to many languages for international use (Ware, 2000).

Almost similar to the SF-36 form is the commonly used World Health Organization Quality of Life (WHOQOL), also labeled WHOQOL-100. It is a 100-item self-administered instrument that is organized in 6 domain and which is applicable cross-culturally. The six domains are the physical, psychological level of independence, social relationships, environment and spiritual/religious/personal belief (Khanna & Tsevat, 2007).

2.4. DETERMINANTS/ FACTORS OF QUALTY OF LIFE

Determinants of quality of life are those factors that aid in acquiring a quality life in older adults or youths. They vary according to the various researches carried out, and there is no universal quality of life determinant The evaluation of QoL depends on the individual's value system and on the cultural environment where he lives (Gileous, 1998, cited by Ruzevicius, 2012). When analyzing QoL, it is important to note that the concept is wider than the issues of an individual's health (Ruzevicius, 2014).

For instance, according to Martinez-Martin et al, (2012), health, family and finances are the main determinants of quality of life, especially in the aged. Depression was the main determinant of quality of life indices, while functional independence and social support influences health-related quality of life and quality of life respectively. These authors explain that, health as a determinant of quality of life in older adults have not always been ranked first, and most third

agers found satisfactory quality of life despite having several health problem. Fernandez-Mayoralas and Perez (2005). The importance of family override health, finances followed, and then health.

For Pawlaczyk, (2017), there are various strategies developed to help older adults and youngsters acquire greater independence and better quality of life. The quality of life of third age persons, similarly to that of the younger individuals does not depend on biological health alone, but also on mental, social, cultural and spiritual functioning. For better self-assessment of health, and physical functioning, staying socially active can be beneficial, as it equally helps in preventing depression and cognitive disorders, therefore, providing intellectual and emotional stimulation which improves overall quality of life.

Quality of life also depends on external factors, such as good living conditions (like employment, income, material welfare, health care services, working conditions, nourishment, crises, stress, to name but a few), such that if these conditions vary, the individual's satisfaction with his QoL will vary as well (Ruzevicius, 2014).

Other authors stressed on income, employment, alleviation of poverty, health, education, social amenities, as aspects that improve quality of life. In the same way, stability in the nation is considered as a prerequisite measure for the enhancement of quality of life, alongside basic needs such as health, drinking water, food and shelter for improving and maintaining quality of life (Mukherje & Bajaj, 1993).

We understand by this that the determinants of a good quality of life vary according to subjective beliefs. This notwithstanding, aspects involving health, income, social amenities and the like are very necessary for overall well-being of third age persons and other older adults of various age range.

2.5. QUALITY OF LIFE THROUGH FEEDING

The interest on the quality of life of third age persons is emphasized as a result of their rapidly increasing population. As such, quality of life through feeding can be looked as both a preventive and an intervention measure, where poor quality of life is associated in the long term with more dependence, health problems, and the risk of mortality, or a means to remedy an existing situation (Bilotta et al., 2011; Villeneuve, 2019). Oliveira, 2020 claims that:

> Food is not only a determinant of health status but also a holistic perspective of quality of life. The study of quality of life in general, and Food-Related Quality of Life (FRQoL) in particular among non-clinical populations of older adults can be especially important, as it allows to understand specific features of healthy ageing and to outline strategies to maintain health in more advanced years (Oliveira, 2020).

Several factors contributing to quality of life enables people of all ages in general and the third age in particular to age well, be healthy, active, autonomous and independent. These factors are regular physical exercises, socialization, education, environmental factors, diet, to name but a few. According to the WHO, regular physical exercises in the elderly for example leads to better cognitive functions and ameliorates socialization as it reinforces bones quality. The same WHO advises that that physical activities be done for about 2 hours 30 minutes per week, separated into many small activities.

However, in this study we will be focusing on one of the key factors to quality of life: nutrition (food or feeding). A good nutritional regiment is that which varies, which is balanced and healthy. One which contains a whole lot of nutrients necessary for growth, health and active ageing. The quality of a food is determined by the quantity of nutrients it provides. It should be packed with nutritive elements such as vitamins and minerals which will enable one to have good health, a good body composition and better performances. In the elderly for example, one of the minerals that is often deficient is zinc, which leads to a decrease in palatability. When corrected, it brings back the sense of taste and smell, which in turn prevents older adults from eating too salty or too

sugary. Most of the nutrients required by the human body can be acquired through food. Oliveira (2019) explains it better when he writes:

> Nutrition and diet in younger or mid-aged individuals have been shown to have a profound effect on cognitive ability later in life. This includes the consumption of the "Mediterranean diet" comprising of fresh fruits, vegetables, fish (omega 3), with very little red meat and refined carbohydrates/grains and sugar. Diets such as these are rich in nutrients, vitamins, and minerals and confer neuroprotective effects (Oliveira 2019).

The Med-diet (Mediterranean diet), is a primarily plant-based eating plan that includes the daily intake of grains, olive oil, fruits, vegetables, beans and other legumes, herbs, spices, nuts, meanwhile food items like animal products are eaten in small amounts, with preferred animal proteins being fish and sea food. In brief, it prioritizes the consumption of healthy fats. (healthy oils like olive oil) and water as the number one beverage, says the Harvard School of Public Health. This diet is known to be one of the most effective when it concerns health. In regards to older adults, Oliveira adds:

> Concerning older adults, studies have shown the beneficial link between antioxidant/vitamin supplements prescribed to patients with hypertension and diabetes, to overall cognitive health. For example, vitamins B6 and B12 can reduce the levels of homocysteine – a vascular disease marker implicated in cognitive decline and dementia. Vitamins C and E (both antioxidants) can reduce the levels of vascular inflammation and could be used to reduce the rates of cognitive decline, especially in intermediate memory (Oliveira 2019).

In brief, a balanced healthy nutritious diet are good at preserving and even improving cognitive abilities in older adults alongside other quality lifestyle aspects like cognitive flexibility stimulating games. Adopting these from early on and with increased frequency is especially beneficial in the slowing of cognitive decline in otherwise healthy older adults. Special considerations to adopt such measures should be made by caregivers, therapists, nurses, specialists and the community.

2.5.1. Nutritional needs of aged persons

Nutrition according to Ferry (2010) defines all the processes of absorption and use of food which are essential for the body's maintenance and energy needs. Ferry (2010) explains that nutrition and health are inseparable at any age, especially with ageing. Hence, maintaining a good nutritional status is the central preservative means of health to the elderly, since this group of the population tend to face several risks due to the various changes they go through with ageing. The French National Food Council says of nutrition that it is the "major factor in the preservation of functional status, and it is also one of the most easily mobilized means of achieving the objective of maintaining a satisfactory state of health". This therefore calls for the need for acute knowledge on the nutritional needs of persons of the third age range (Garcia, 2009).

According to Martin et al. (2001), nutritional needs are not reduced in old people, it is the nutrients that are absorbed less efficiently. For example, there is the decrease in the absorption of nutrients (vitamins and minerals) such as the B, D vitamins, calcium, magnesium to list but a few, as people age. Older adults often have deficiencies of Vitamins B and D, with vitamins B6 and B12 being important vitamins in the prevention of cognitive decline, meanwhile calcium and vitamin D help reduce the risk of fractures. These vitamins can be found in a variety of food like soy beans, meat, milk, eggs, leafy greens, avocado, whole-grains, various fruits… Therefore, without eating much, older adults should eat better (Ferry, 2010). Ferry (2010) adds that, in relation to the metabolic changes associated with ageing, diets sufficient in protein are of good biological value, sugars are necessary for energy metabolism without increasing the relative resistance to insulin, vegetables and fruit for their contribution in vitamin and minerals (particularly antioxidants), and also essential fatty acids, as are certain vegetable oils with omega 3.

2.5.2. Factors influencing the eating behaviour of older adults

Individuals' feeding habits are influenced by several factors throughout their ageing process. Diet quality is a concept which lays emphasize on the totality of what an individual eats and drinks as a whole. Which is aimed at ensuring improvements in the individuals' and the entire population's health. Ageing itself may increase the risk of poor nutrition due to the co-existence of several factors such as frailty (Nazri et al., 2020)**,** and a variety of other resources like monthly income, mental and physical health.

In addition to these variables, the way older people perceive other resources, such as their level of appetite, their food knowledge, their perception of the distance to the markets, access to high-quality products, having better kitchen facilities, access to good service providers and support from family and surroundings, all contributes to how varied the diet they eat will be (Dean et al., 2009).

The quality of diet (nutritional content, food safety) is a key element to older people's well-being, and addressing the issue of food choices for the elderly may provide valuable information for policy makers and care givers. For elderly individuals, inadequate nutrition can increase the incidence and severity of disease, thus hastening the loss of independence (Minuti et al., 2014). They add that:

> The choice of a healthy and a varied diet is challenging for people aged 60 or above, because the ability to choose a diet which meets their nutritional needs may be adversely affected by the pathological, physiological, economic, and societal factors that accompany ageing. Thus, to better understand and solve the nutritional problems of the elderly, it is important to identify these factors and how they affect food choices (Minuti et al., 2014).

The study by Kvalsik et al. (2021) found 5 broad levels considered to influence behavior: intrapersonal factor (individual factors), interpersonal factors (social factors), institutional factors, community factors, and public policy factors (societal). They equally found that seven environmental factors playing a role in the eating habits of older individuals, which they organized into three levels of influence, namely: the interpersonal influence, comprising the food habits of significant others, household composition and social relationship. Community influence, involving senior centers and food access. And finally, public policy influence, comprising health information and transportation/mobility aids. Implying that the social environment and community have the potential to change older adult's eating behavior in desirable directions. Also, consistent health information conveyed through various media or health professionals may encourage older adults to improve their eating behavior.

Multiple environmental and individual factor impact older adults' eating behavior and ultimately, health outcome (Story et al., 2002). This is in line with the ecological systems theory of Bronfenbrenner, which highlights that the individual is influenced by the environment in which he lives. This is to say that environmental factors may affect the eating behaviors of older persons.

2.6. QUALITY FEEDING AND COGNITIVE FLEXIBILITY

The relationship between nutrition and cognitive flexibility can be explained in the light of psychological and social contexts (Sakai, 2014, as cited by Khodarami, 2018).

For Khodarami (2018), optimal nutrition is an important factor in the physiological maintenance, regulation and survival of individuals across their lifespan. To him, a balanced nutritional diet through its food sources can provide all 24 elements (like manganese, potassium, nitrogen) required by the human body to keep it fit. Hence, a healthy diet can prevent the development of illnesses while an unhealthy diet can lead to the prevalence of diseases and mental dysfunctions. In his study, (Khodarami, 2018), he investigates the relationship existing between nutrition status, executive cognitive functions, and cognitive flexibility. His results showed significant positive relationship between nutrition status and cognitive flexibility, hence entering in line with the current literature that support the role that nutrition plays on the cognitive functioning and the cognitive flexibility of healthy individuals - adults and children. Affirming that food choices and diet quality influences cognitive flexibility.

Best and Dye (2012) on their part have provided an innovative scientific summary of research on nutrition and cognition, bringing forth very important information on nutrition and lifestyle choices for cognitive health. These authors wrote on nutrition and cognition in the context of ageing, and the role that dietary patterns play. They believe that with age, physical and mental status deteriorates, especially with declines in the quality of life. As such, they insist on the role of modifiable lifestyle factors like healthy diets and physical activities which to them can be evoked as preventive strategies. With the primary prevention option being the Nutrition-based strategy for cognitive ageing and impairment, that focuses on the overall dietary pattern.

In the same vein, to Barnes and Joyner (2012), there are diets that contribute to cognitive impairment and general physiological decline. Diets containing high content of saturated fat and refined sugars like fructose and sucrose for instance are capable of causing impairment and decline on the cognitive and physiological health of its consumers. These authors also mentioned the fact that there have been an emergence of evidences especially in regards to the ageing population supporting the connection between dietary intake and cognitive health. With those researches arriving at the conclusion that during the mid-age years, a healthier diet that comprises the B-vitamins, antioxidants, polyunsaturated fatty acids… were associated with better cognitive functions in later life (Kesse-Guyot & al, 2012, as cited in Barnes & Joyner, 2012).

2.7. THEORETICAL REFERENCE MODELS

2.7.1. Bronfenbrenner's bioecological systems theory (1998)

Bronfenbrenner's theory is used in this study as it focuses on the quality and context of individuals' lives as viewed through developmental phases that occur within the context of complex interconnections between systems. It defines the complex layers of environment which each have an effect on third age person's choices regarding their eating habits and quality of life standards in view of maintaining cognitive health. The ecological system theory has recently been extended and renamed "bioecological model of human development" to emphasizes that an individual's own biology is a primary environment which sustains his development. This is relevant for our study as it shows that the interaction between the factors in an elderly person's maturing biology, immediate family/community environment, and the society at large governs his quality of life choices and eating habit.

It therefore describes the lifelong progressive understanding that people of this age bracket (third age) make regarding the changes they encounter around their environment, since it is this environment and the ecological realities that surrounds it that influences the behavior they engage themselves into. Therefore, a positive, healthy and safe social environment will provide optimal outcomes and cognitive health. Bronfenbrenner introduced the idea that dynamic environments are important influences in developing individuals and that individuals can influence their environment in return (Bronfenbrenner, 2004, Bronfenbrenner & Morris, 2006). Bronfenbrenner (1977), described human development as "the progressive, mutual accommodation throughout the lifespan between the growing human organism and the changing immediate environment in which it lives".

The ecological systems theory is conceptualized in terms of systems ranging from micro to macro, comprising the microsystems, mesosystems, exosystems and the macrosystems. The theory posits that human development/behaviour is determined by these four levels of systems, to which he adds the chronosystem - which includes the concept of individuals as constantly changing over their lifespan and how the time period in which they live influences their approach to their environment. This new concept adds the influence of chronological age to expectations and assumptions during development and it reflects the non-static nature of influences around older people which may influence their behavior vis-à-vis their quality of life and nutrition. For instance, over time there may be an increase in the cost of living, rarity of good food resources, conflicts in the family, loss of appetite in the elder, drop in motivation which may in turn influence behavior and choices.

This model's core system is the microsystem which Bronfenbrenner (1977, p.154) defines as the complex relationship between a person and the immediate environment setting containing him. It is the most intimate, durable, influential, intense and innermost level of the different systems that make up the environment. It is in this system that most of the individual's behaviour is learned, making him the product of his microsystem. This system is described as bidirectional, such that both the individual and the immediate environment develop and influence each other. It includes their families, peer groups, churches etc. and its influence extents to all aspects including nutrition choices, health, beliefs, security, to name but a few.

According to Bronfenbrenner, individuals' development/behaviour cannot be fully understood without paying attention to the influence or interaction between the different systems surrounding them. The metaphor of the "Chinese box" (boxes within boxes) has been used by some researchers to capture the multilevel, integrated quality of the ecological model (Susser and Susser, 1996, p.676), the outer box may be thought as representing the overall physical environment, which in turn contains societies and populations, single individuals and individual physiological systems. Our intention in relation to this theory is to extend its concepts to understanding the role of older adults' biology and environmental exposures on their choices and behavior regarding quality living and nutrition for cognitive health maintenance. As such, our focus is placed on Brofenbrenner's bioecological model.

In 2005, Bronfenbrenner intergrated to the concept of ecological environments, time, processes and characteristics into the model he described as a "process-person-context-time" model (PPCT model), or the bioecological model. He used this model to explain how a person's development can be changed overtime within certain environments, defining the individual at the center of the system with time being the major driving factor of the change. The bioecological model of development is defined as the phenomenon of continuity and change in the biopsychological characteristics of human beings, both as individuals and as groups. The phenomenon extends over the life course. The bioecological model has four defining properties as stated earlier which are (1) Process, (2) Person, (3) Context, and (4) Time.

Process constitutes the core of the model, it constitutes forms of interactions between organism and environment, also called proximal processes, that operates over time and are posited as the primary mechanism producing human development. This implies that for the third age person, process which are the reciprocal interaction the adult has with people around him and with objects in the environment is the base of their quality of life through nutrition, as it is through these interactions that the elderly gets information on tips and tools for quality living necessary for health and maintenance. This is confirmed when Bronfenbrenner talks of proximal processes as the reciprocal interactions taking place between a developing human being and one or more of the persons, objects, and symbols in his immediate environment. He further explains that proximal processes become progressively more complex as time passes, as such they equally become likely to help the ageing individual gain knowledge, skills, abilities (become more competent) (Xia et

al., 2020). “Process” therefore explains that older adults’ quality of life and nutrition is influenced by the interaction they have with people and objects around them: communication with friends and families, strangers or foreigners, their observation of other’s lifestyle and its results, the knowledge acquired with the passage of time such as, knowledge from books on the topic greatly influences their overall lifestyle choices.

Person comprises characteristics such as force (predisposition), resource and demand. Force being those dynamic personality traits that can either promote interaction or interfere with their occurrence. Resource characteristics are those biological, mental or experiential resources that individuals bring to proximal processes. Demand characteristics are those easily visible factors that can invite or discourage reactions from the social environment and so facilitate or impede the initiation of proximal processes.

Context is made up of all the systems- microsystem, mesosytem, exosystem and macrosystems. While Time is the final construct of the PPCT model which is comprised of three types: the microtime which deals with all that happens in the proximal process (the extent to which there is continuity or discontinuity in the older adults’ activities or interaction); the mesotime refers to the extent to which the proximal processes occur over days, weeks, months; and the macrotime, similar to the chronosystem focuses on the changing expectations and events in the larger society, both within and across generations, as they affect and are affected by processes and outcomes of human development over the life course.

Since ageing represents a complex blending of physiological, behavioral, social and environmental changes occurring at both the level of the individual and at the level of the wider community including environmental changes, people ageing in today’s world experience changes throughout, including feeding, resources quality and social changes. An ecological model is therefore ideally suitable for this study as it describes and explain these complex blend in regards to quality living and nutrition choice in the elderly. It also has a long history in the biological, behavioral, social and health sciences (Bronfenbrenner, 1979). Also, according to the model, age differences shape the context in which individuals function and therefore also influences health risks, health behaviour and choices directly and/or indirectly. This theory is equally used in our study as it identifies multiple points of possible intervention from the biological level to the environmental level to postpone the risks of diseases, disability and enhance the chances for health

and longetivity. Like Bandura's social cognitive theory, environment has an explicit or implicit consideration as it is a crucial mechanism in development (Bronfenbrenner, 1974).

In brief, this explains that the third age persons' own biology (innate characteristics, genes…) is in itself an environment which sustaining his development even as he chooses to incorporate quality lifestyle and healthy feeding habit. These internal factors are backed up by support from the environment (families and community at large), assuring proper development with time. As in relation to health, the ecological model has been used to describe and explain the multilevel factors on the cause of health conditions and its consequences, on conditions such as the Alzheimer's diseases or cognitive inflexibility as a result of cognitive decline. Bronfenbrenner's model therefore allows us to have a better understanding of community phenomenon, so as to use effective natural intervention throughout development to solve specific health issues in the elderly in our society. His model provides a concrete conceptual framework to explore environmental factors influence on human health development and is recognized as a tool to support the understanding of a complex phenomenon considering all relevant aspects under a certain surrounding system.

2.7.2. Bandura's social cognitive theory (1986)

Bandura's social cognitive theory lays emphasis on the individual's perception of his capacity to produce a desired result toward a task. It focuses on a person's personal efficacy. Bandura uses the term "self-efficacy" to refer to a person's self-judgment on his capacity to act on himself, on his surrounding and on others when faced with a specific situation (Carré, 2004, p. 14). In other words, it is the person's belief on his competence in regard to change and personal development on the one hand, and his beliefs in regards to his intervention capacity towards other persons or things, on the other hand.

Bandura modified his theory from the social learning theory to social "cognitive" theory (SCT), to emphasize that cognition plays a critical role in peoples' capability to construct reality, self-regulate, encode information, and perform behaviour. He elaborated a model named the triadic reciprocal determinism, which states that a person's behavior both influences and is influenced by personal factors and the environment. With a person's internal factor made up of events experienced in a remarkable way according to variations in their self-efficacy beliefs. Therefore, determinism portrays that a person's action, behavior, or decisions are an outcome of the events

that have happened in the past, their actions are simply reactions to what have already happened in the past.

In short, Bandura's reciprocal determinism posits that people's manner of acting are influenced by three factors: personal factors, behavior and environment. All three factors are mutually dependent, the environment, personal factors (comprising beliefs, goals, expectations, values, thoughts, feelings…) and behavior work together to cause or change an individual's behavior. In this light, older people, in view of ameliorating their quality of life and feeding behavior will consider the influence of their immediate environment and their individual characteristics in order to perform behavior. And in turn, their behavior is responsible for changes in the environment (triadic reciprocal determinism /causation). The basis of reciprocal determinism should therefore transform individual behavior by allowing subjective thoughts to merge with the environmental to produce result.

Using the social cognitive theory as a framework, adults can therefore work to improve their health states and quality of life by correcting their faulty self-beliefs, thinking habits, etc. (personal factors), they will have to go further to improve their self-regulatory practices (behavior), and alter structures in their surrounding that may work to undermine their end results (environmental factors). Bandura's social cognitive perspective is the understanding that individuals possess certain capabilities that defines them, they have what it takes to trigger behaviour. Primary among these capabilities are the capacity to plan alternative strategies, learn through experience, self-regulate, and self-reflect. These capabilities provide individuals with the cognitive means by which they are influential in determining their own destinies. As such, they can extract meaning from their environment, construct guides for action, solve problems cognitively, support courses of action, gain new knowledge by reflective thoughts, and communicate with others for effectiveness. This implies that older adults desiring to increase their quality of life and feeding behavior have the capacity of extracting meaning from the environment to construct guides for actions.

Also the social cognitive theory is rooted in a view of human agency in which individuals are agents proactively engaged in their own development and can make things happen by their actions. This is possible by the fact that, as mentioned above, among other personal factors, individuals possess self-beliefs that enable them to exercise a measure of control over their

thoughts, feelings, and actions, that "what people think, believe, and feel affects how they behave" (Bandura, 1986, p. 25). As such, the elderly have a major role to play in relation to their eating behavior and life quality and they possess in them abilities to make things happen. For the belief that people have about themselves are critical elements in the control of their person, adapting and changing at the individual level and at the collective level.

In a nutshell, applying this theory to third age persons' pursuit for cognitive health through quality feeding habits and quality of life, we understand that a successful change in behavior will have to pass through three major constructs (personal factor, environment and behavior) that interact to influence their behavior. Personal factors comprising previous experiences, previous behavior, beliefs, culture and even age would play a role regarding the action in question. The environment plays a great role, for example, it may grant access to information regarding the decision of eating healthy, give access to resources, safety, support from family, friends, care-givers. Finally aspects of the behavior itself which involves the outcomes or results from the behavior, achievements.

In the same manner these constructs and factors are applied in case of change of behavior. Successful efforts would include the identification of positive support and the denominators of each of the constructs as explained above. Goal setting and social support playing a key role in adopting health behaviours alongside self-efficacy and self-regulation. Individuals have self--regulatory mechanisms that provide the potential for self-directed changes in their behavior. The manner and degree to which people self-regulate their own actions and behavior involve the accuracy and consistency of their self-observation and self-monitoring, the judgments they make regarding their actions, choices, and attributions, and, finally, the evaluative and tangible reactions they make to their own behavior through the self-regulatory process. This sub-function includes evaluations of one's own self (self-concept, self-esteem, values) and tangible self-motivators that act as personal incentives to behave in self-directed manners.

For Bandura (1986), the capability that is most "distinctly human" (p. 21) is that of self-reflection, through self-reflection, people make sense of their experiences, explore their own cognitions more, engage in self-evaluation, and alter their thinking and behavior where necessary. Strategies for increasing wellbeing usually aiming at improving health, cognition and increasing behavioral competencies and conditions under which people live.

2.7.3. Ajzen's theory of planned behavior (1991)

Ajzen's Theory of Planned Behavior (TPB) predicts an individual's intention to engage in a behaviour at a specific time and place. It posits that individuals' behaviour are driven by behaviour intentions. That is, intentions to perform behavior of different types depend on the attitude of the individual toward the behavior. The TPB is the successor of the Theory of Reasoned Action (TRA) of Ajzen and Fishbein (1975, 1980) which provides a simple and logical framework for measuring the relationship between beliefs, attitudes, subjective norms, intentions and behavior. Ajzen modified this theory to include perceived behavior control, defined by the individual's belief that adopting a behaviour will be doable or not. It considers cognitive self-regulation as that which plays an important role. The TPB can then be summarized in that when an individual has a favorable attitude towards a given behavior (eating behavior or quality lifestyle), and he perceives that significant others wants him or her to perform this behavior, and, in addition, feels capable of performing the behavior, he will have a higher intention to adopt the behavior.

Our focus on Ajzen's work is on its special organization and human decision processes which focuses on cognitive self-regulation as an important aspect of human behavior. The individual in view of deciding to carry out a behavior, takes into consideration every information at his disposal, evaluates the implications of carrying out the act and the consequences that may come forth. Hence, his decision is a reasoned, planned and controlled one. Which explains the idea of applying this theory in the domain of quality of life and healthy eating, depicting the main psychological causes behind behaviors, and this knowledge will provide valuable information that can be used for predicting and influencing behavior.

Behavior intentions of the TPB are a function of three determinants as explained by the author of this theory: Attitudes towards behavior, subjective norms and perceived behavioural control. Behaviour intention represents a person's motivation in the sense of his conscious plan or decision to perform a certain behavior (Conner & Armitage, 1998). This means that the stronger the intention, the more likely the behaviour will be performed. All the other construct within the TPB work together to create someone's behavioural intention. So, the TPB aims to estimate a person's behavioural intentions and, therefore determine whether they will take part in a specific behavior or not.

Attitude towards behavior as explained by Ajzen is the degree to which a person has a positive or negative feelings (favourable or unfavourable attitude) towards a behavior of interest. However, these attitudes towards behavior of the individual does not guarantee that it is the right attitude nor that t is objective and logical. It simply implies that the person is acting upon innate short-term decision taking into consideration the results that may emerge from performing the act. As such most third age persons adopt certain behavior in regard to their wellbeing based on their feelings and not on their overall well-being objective such as the implication on their cognitive health (in our case). Attitudes therefore are based on possibilities, and the degree of importance given it by individual.

Subjective norms refers to the beliefs of whether significant others think of the behavior, and whether the behavior should be performed. It is concern with the individual's perception of the social environment surrounding the said behavior. In other words, it is the individual's perception of a behavior, based on significant persons point of view or judgment. In this case, the individual's peers, family members, care-givers and other important personalities in his life play a particularly important role in his decision to apply a particular lifestyle and/or feeding habit. The individual's personal motivation and will equally plays a role at this level.

And lastly, perceived behavior control, explained as an individual's perception of the extent to which performance of the behavior is easy or difficult (Ajzen, 1991). Perceived behavior control increases when individuals perceive they have more resources and confidence accomplishing the action (Ajzen, 1985; Hartwick & Barki, 1994; Lee & Kozar, 2005). Perceived behavior could equally be influenced by passed experience and anticipated difficulties, and hence can indirectly or directly determine whether the behavior will be applied or not. A combination of these explains that, attitudes toward the behavior, subjective norm and perception of behavioural control lead to the formation of a behavioural intention. And as a general rule, the more favourable the attitude and subjective norm and the greater the perceived control, the stronger should be the person's intention to perform the behavior in question.

2.8. Theoretical observation

The theories presented in this study lay possible explanations of the factors that influences behavior and the factors involved in proper behavior change. None of the theories are ideal and each one is limited in its capacity of explaining the modification of behavior. However, the importance of these theories are relevant in that they contribute in the promotion of health – in this case, a healthy cognitive flexibility in the elderly. They offer interesting insight on behavior modification in view of positive results which can be applicable to any other health domain, seen in that, persons who adopt healthy behavior experience long term healthy results, whereas those whose behavior are unhealthy deal with the "disabling" consequences that follows it. In brief, these theories' objective is to develop competences that would enable autonomy and independence, as they are educative and susceptible of bringing forth transformations in subjects in order to achieve long lasting positive modifications. For, knowledge in the domain of health is a key to keep hold of.

In summary, we see through this second chapter that quality of life is a multidimensional and multifaceted concept which takes into consideration the subjective nature of individuals, yet, it has a great role to play in the overall well-being of individuals and societies at large. A lot of factors determine QoL, including external factors such as diet, and lifestyle and behavior. Which is what the theories in this chapter aimed at presenting. The chapter that follows will present the methodology of the study.

CHAPTER 3:

METHODOLOGY OF THE RESEARCH

Throughout this chapter, we will be presenting the methodology of our work. We begin by recalling the main research question of the study, presenting the type of research, the site of the study, the population of study, the mode of participants' selection, the instrument for data collection, and techniques of data analysis.

3.1. RECALL OF THE RESEARCH QUESTION

The issue of autonomy and independence loss among older adults of the third age is among others the result of declines encountered at the level of mental flexibility. Mental flexibility as per numerous researches can be enhanced through nutritive quality of life. However, it is known that eating habits in the elderly is influenced by numerous factors among which are intrinsic and environmental factors as points the bioecological system theory of Bronfenbrenner.

Even though older people have the tendency of feeling less hungry, which results in reduction in food consumption, which implies that they have less daily nutrients intake, and which in turn can become severe enough to impair daily life and independent function, eating behaviours or eating behavior modifications can be put in place thanks to the Social Cognitive theory and Theory of Planned Behavior with aim of improving the eating habits of the elderly. This is possible through appropriate knowledge on the subject matter (feeding quality of life) and appropriate application of gained insight through interactions or experiences, especially during the various critical moments of people's development.

Bronfenbrenner (1998), talks on how individuals' behaviours are influenced by their communities and societies, hence bringing an understanding to why people, third age people not excluded may behave differently in their feeding habits when compared to certain environmental contexts. With their own biology being the primary environment. Implying that the interaction between the factors in people's maturing biology, immediate family and the society at large

governs the development of their feeding quality of life such that they are now free to maintain their own feeding regimen in anticipation of overall mental flexibility and general health maintenance.

Hence, describing the lifelong progressive understanding that individuals make regarding the changes they encounter around their environment that pushes them to rely on a given way of life. Since an individual's environment and the ecological realities that surrounds it influences his development and behavior. As such, positive, healthy, and safe social environments are important for optimal developmental outcomes meanwhile the negative surrounding will eventually have a negative impact. Nevertheless, the elderly have in them what it takes to take appropriate actions.

As seen in Bandura (1986), individuals including third agers are proactively engaged agents in their own development so much so that they can make things happen by their actions because they possess within themselves self-beliefs that enable them to control their thoughts, feelings, actions, as these affects how they behave (p.25). Quality of life plays an undeniable role in cognitive flexibility. As cognitive flexibility abilities allows for appropriate use of individual abilities to regulate situations like understanding and problem-solving (Spiro & Jehng, 1990). So, this projected doubling of the elderly's population will have major health implications, especially if this increase is characterized by persons who are frail, non-autonomous and dependent. Considering that ageing is not just a family situation, but a societal phenomenon as well. Emphasis therefore is placed on the need for quality dietary lifestyle as a remedy or preventive measure in view of better flexibility maintenance in third age persons for their own self-dependence ad autonomy. Thus, the research question: How does dietary quality of life maintain cognitive flexibility in third age persons?

3.2. HYPOTHESIS OF THE STUDY

This study's hypothesis is the work hypothesis, it serves as a guideline for the research. The aim here is neither to test nor verify it, but rather to understand it.

3.2.1. General research hypothesis

GRH: Interventions on lifestyle through diet can maintain/delay declines of cognitive flexibility in third age persons

3.2.2. Definition of the study's variables

Defining the variables of a hypothesis is done through the theoretical framework of the study. It is from the research hypothesis that the analysis model is built. The model is an abstract representation of reality that is organized around concepts. This means that, the analysis model makes explicit the links between the concepts, which makes it possible to describe a psychological phenomenon that cannot always be observed. This model will be the support that will allow the concepts to be translated into indicators of observable phenomena, such as behaviours. This procedure, which consists of matching an abstract notion – the concepts to an indicator, is essential in research. Indeed we will be able to proceed to the observation and measurement of observable phenomena. We also say that the concepts will become operational because the researcher will define their dimensions which will be translated by indicators. This way of proceeding is also called the operationalization phase of the research hypothesis.

3.2.3. The Independent variable: Quality of life through feeding

Modality 1: Process (Reciprocal interactions)

Indicator 1: Interactions with people

Indices: Communication with others (parents, friends, neighbours, doctors…); observation of other's lifestyle; reading of books on the subject; testimonies from others.

Indicator 2: Interactions with objects

Indices: the use of smart objects: the internet, television (visuals), radio for information gathering; machines use to ease daily living: kitchen tools/utensils (blenders, mixers…)

Modality 2: Person

Indicator 1: Dispositions (His/her quality of mind and character)

Indices: Mental dispositions: beliefs (culture), perception of health situation/risks; physical disposition: role perception, personal skill application, planned action and application.

Indicator 2: Resources characteristics (Bioecological)

Indices: Personal experiences/knowledge: anticipations, responsibility, hopes, doubts, feelings; physical/mental appearance: age influences, external influences, curiosity, self-efficacy, persistence, disabilities

Modality 3: Time

Indicator 1: Microtime

Indices: Happenings during interaction with persons/objects; extent to which there have been continuity or discontinuity in the activities or interactions

Indicator 2: Mesotime

Indices: how often healthy practices occur over days, weeks, months…; expectation and consistency of practices over longer time periods

3.2.4. The Dependent variable: cognitive flexibility

Modality 1: self-regulation

Indicator 1: Identification of an error

Indices: Adequate representation of the problem; comprehension (manner of understanding a situation)

Indicator 2: Appropriate process of change

Indices: knowledge available in memory (from past and present); representations (properties of the situation/discovery of solution

Modality 2: Adapted performance

Indicator 3: Modification of behavior

Indices: Reactive (reacting to the past or on past situations); proactive thinking (doing things in advance to influence situations: engaging in self-directed and future-oriented changes); spontaneous behavior such as in task switching behavior.

Indicator 4: Goal-oriented behavior

Indices: capacity to change topic of conversation, setting of short and long term goals

Table 1: **Summary of the variables, modalities, indicators and indices**

Variables		Modalities		Indicators	Indices
IV : Quality of life through feeding	***IV 1***	Process (reciprocal interactions)	***I1***	Interactions with people	Communication with others (parents, friends, neighbor, children, doctors); Observation of others lifestyle, reading of books, testimonies from others
			I2	Interactions with objects	The use of smart objects : the internet, Tv (visuals), radio for information gathering; Machines use to ease daily living : kitchen tools (blender,mixers…)
	IV 2	Person	***I1***	Dispositions (his/her quality of mind and character)	Mental dispositions: beliefs (culture), perception of health situation/risks; Physical dispositions: role perception personal skill application, planned actions and application
			I2	Resources characteristics (bioecological)	Personal Experience/ knowledge : anticipations, responsibility, hopes, doubts, feelings Physical appearance (age influence, external influence, curiosity, self-efficacy and persistence
	IV 3	Time	***I1***	Microtime	Happenings during interaction with persons/objects Extent to which there have been continuity or discontinuity in the activities or interactions
			I2	Mesotime	How often healthy practice occur over days , weeks months Expectation and Consistency of practices over a longer time period
VD : Coginitive flexibity	***DV 1***	Self-regulation	***I1***	Identification of an error	Adequate representation of the problem Comprehension: manner of understanding the situation
			I2	Appropriate process of change	Knowledge available in memory (from the past and present). Representation: properties of the situation / discovery of solution
	DV 2	Adapted performance	***I1***	Modification of behaviour	Reactive : reacting to the past or on past situation -Proactive thinking. Doing things in advance to influence situations: engaging in self-directed and future-oriented changes. -Spontaneous behaviour such as in task switching behaviour
			I2	Goal-oriented behaviour	Capacity to change topic of conversation, Setting of short and long- term goals

3.2.5. Specific hypotheses

SRH 1: Reciprocal interactions maintains cognitive flexibility in third age people in view of maintaining their autonomy and independence.

SRH 2: Person maintains cognitive flexibility in third age persons towards maintaining their autonomy and independence.

SRH 3: Time maintains cognitive flexibility in third age persons with aim of maintaining autonomy and independence

3.3. TYPE OF RESEARCH

This study follows the qualitative method since we seek to better apprehend and bring to light behaviours, attitudes, motivations, beliefs… as factors playing a role in third age persons' quality of life via feeding in view of a better mental flexibility with advance in age. The qualitative method is used in this study, as it makes it possible to describe, explain, and predict phenomena by means of concepts operationalized in the form of variables to be analyzed. It equally brings profound understanding and clarification on complex topics, such as the one this study seeks to apprehend.

Following this research type, the comprehensive approach was chosen, for, this study seeks to understand how a quality of life focused on diet is capable of improving cognitive flexibility in third age people. This approach is used because it enables the manipulation of known phenomenon or phenomena already described on which understanding is sought. In brief, we desire to understand why these things work the way they do.

3.3.1. Research Method: Case study

The research method this study uses is the case study method (the study of multiple cases). The case study is like an empirical investigation that studies a contemporary phenomenon in its real life context. It allows for an investigation opened to real world characteristics, where components are not to be perfect, but should be as they usually are in reality. Cases in a case study are therefore not supposed to be examples or models to be followed, rather, they are firstly made of their own dynamisms.

Looking at it through the lens of research, Collerette, (1996) says of the case study that it is a particular technique for gathering information that seeks an account on the evolving and complex nature of phenomena concerning social systems having their own dynamics.

The case study equally seeks to reveal the trajectories that the phenomenon studied follows in order to identify their particularities. One of its characteristics is to attempt a description of the complexity of situation in order to shed light on the multiple dynamic links uniting various elements. Usually, for better control in research, there is the need for the reduction of elements, however, this is not the case with the case study, as the most determining elements and processes are instead taken into account here.

It consists of reporting and analyzing a real life situation as taken in its context in order to discover phenomena that interests the researcher, how it manifests and how it evolve. In this way, providing situations where the researcher will be able to observe the unfolding of large number of factors interacting together. Hence, making it possible to account for such complexity through the richness of the situations involving human interactions; and then report on the meaning attributed them.

The case study can be said to be a technique of situational analysis, wherein the cases themselves are of secondary interest as they act as supports facilitating the understanding of something else by providing the researcher with an observation site that would enable the step by step discovery of particular processes. The case study therefore primarily constitute a strategy for the gathering and organization of raw data. The use of case studies is well beneficial in qualitative researches, and so it is adopted it in this study.

3.3.2. Justification of the case study choice

The case study is chosen as the research method in this study in order to understand in an in-depth and global manner how quality feeding or quality of life through feeding intervenes in the cognitive flexibility of participants in this study. Taking each case in his/her singularity, identifying the biographical and situational/feeding factors that account for cognitive flexibility.

The case study method is chosen too due to the fact that it is useful in situations where there's need for clarity on the whys and hows of things, and in situations wherein researchers have little or no control on events studied or concerning contemporary real life situations.

The case study can be classified into three categories namely: the intrinsic, the instrumental and multiple case study, says Stake (1994). Intrinsic case studies for instance are carried out on cases having unique characteristics or characteristics on which science has not yet had access over, or on things which have not yet been known or discovered. The use of this type of case study can be justified in that it represents a typical case to test a given theory with the aim of confirming, testing or enriching the theory. In this study we are using the multiple case study from which information studied and targeted will be retained.

Also, this study makes use of the case method as it enables two levels of comprehension. Firstly, the narration of the situation studied, through the cases we follow the evolution of events considered pertinent for the study. And secondly, the abstract order, focuses on the analysis and explanations of the case. Bringing forth the circular causality link between the events presented. By so doing, complicated things are made easy to understand.

Lastly, we used the case study method in this research for they can be used as research methods which allows one to take into consideration significant and holistic characteristics of the events studied. This is because the case study is a research approach that is used to generate in-depth and multifaceted understanding of complex issue in their real life context.

3.4. PRESENTATION AND JUSTIFICATION OF STUDY'S SITE

This study was carried out in the center region of Cameroon, in a quarter of the city of Yaounde named Etoug-ebe. Etoug-Ebe is precisely found in the district of Yaounde VI, in the department of Mfoundi in the center region of Cameroon. Its neighbouring quarters are among others Biyem-Assi and Mvog-Betsi. The choice of this study's site is justified in that it contains the population of study, and it is in this town that we had first made our first observations which led to the formulation of the scientific question this study aims at answering.

Like most towns, Yaounde is experiencing an accelerative demographic growth, characterized by rural exodus. In Yaounde we find older adult of all ethnic groups living in their houses. The quarter Etoug-Ebe, is one of the quarters that attracts a large number of people of all ages through its many social amenities, such as the Etoug-Ebe Government high and primary schools, the Etoug-Ebe rehabilitation center, the Etoug-ebe Baptist hospital, tarred main roads… which attracts people of all ages to settle there, since it characterizes the type of place a good home should be located in.

3.5. THE STUDY'S POPULATION

For the purpose of this research, the population of study consists of older adults of both genders (female and male), from any ethnic background and any educational level, who are currently living in the town of Yaounde, in their home and not in institutions.

Specifically, we focus on older adults of the third age range, as explained in chapter 1, this study considers third age people those older adults male and females who have crossed the middle age but have not yet reached the oldest stage of old age, we consider persons aged from age 65 to age 79. They are also defined as persons who are now free to enjoy retirement, free from external pressures, and free to settle in for new adventures and personal fulfillment, for they have reach the retirement age.

3.6. MODE OF PARTICIPANTS RECRUITMENT

We worked with people who were available and willing to participate in the research, we especially worked with those who presented the various characteristics required. For participants recruitment, we proceeded by Beaud's (2009) "reasoned choice sampling" technique which explains that the choice of participants is based on the researcher's personal judgment as to whether a participant should be considered or not, allowing them to carry out studies on rare and/or unusual phenomena.

3.6.1. Inclusion Criteria

The recruitment of participants followed the following criteria

- Persons who have agreed to participate in the research;
- Be aged around 65 to 79 years old;
- Male or female Cameroonian living at home;
- Be one who is currently living in Yaounde
- Be a resident of the Etoug-Ebe quarter;
- Be available for the interview sessions;
- Give their consent to be recorded

3.6.2. Criteria of non-inclusion

Participants presenting the following criteria were not chosen

- Being age lesser than 65 years and greater than 79 years old
- Not haven agreed to participate in the research
- Being sick and incapable of following up the interview

3.6.3. Participants' Characteristics

Table 2: Participants' characteristics

Participants	Ages	Gender	Rank in the family	Marital status	Academic level	Profession
Case R	68	Female	4/5	Widow	form 4	Housewife
Case E	66	Female	1/7	Married	GCE holder	Teacher, retired
Case S	65	Female	2/6	Married	GCE holder	Housewife
Case T	65	Male	1/1	Widower	University dropout	Retired

3.7. PROCESS OF DATA COLLECTION

3.7.1. Technique of data collection: semi-directive interview

For data collection, we made use of the clinical interview which is that tool that allows clinicians or researchers to gather subjective information such as experiences, feelings, and representations as actualized or transmitted through speech. We chose this method due to the verbal and non-numerical type of information we desired to gather toward the participants, among which were their experiences, their point of view, their history, their manner of functioning, their mode of communication, to list but a few.

To achieve our objectives, we proceeded with the use of a semi-directive interview. We used it with the aim of acquiring specific information from participants following a thematic interview guide that targeted events lived by participants, enabling us to observe adequate reactions or behaviours during the interview. The guide equally served as guidelines enabling us to focus only on that which was desired during data collection. Hence, giving way for participants to freely express their point of views, thoughts and give their overall remarks and answers.

3.7.2. Instrument of data collection: the thematic interview guide

The data collection process began with the development of an interview guide (a thematic interview guide). This instrument was used because it has the capacity of enabling the researcher to touch the various themes and concepts in his study during the interview sessions with

participants. It is at the researcher's disposal to enable him follow a defined methodology, while at the same time observing adequate behavior during interview

3.7.3. Construction of the thematic interview guide

The construction of the various themes in relation to the objectives of this study came forth from the operationalization of the independent variable (quality of life through feeding). The operationalization appeared from the theoretical model from three themes (modalities) were accompanied by two subthemes each (indicators). And two other themes having two subtheme each were obtained from the dependent variable (cognitive flexibility), equally derived from a theoretical model. These themes and subthemes were used in the construction of the thematic interview guide. The guide was used during the various interviews before participants for data collection.

The thematic interview guide

Identification

Nickname

Age

Gender

Rank in the family

Marital status

Academic

Profession

THEME 1: Process (Reciprocal Interactions)

(Can you tell me about nutrition/feeding? How important can it be in maintaining health in people as they grow?)

Subtheme 1: Interactions with people

Subtheme 2: Interaction with objects

THEME 2: Person

(How do you react to the new ideas you get on the topic? What strategies do you put in place to make it happen?)

Subtheme 1: Dispositions (His/her quality of mind and character)

Subtheme 2: Resources characteristics (bioecological)

THEME 3: Time

(How often and for how long have you been practicing the feeding habit?)

Subtheme 1: Microtime

Subtheme 2: Mesotime

3.7.4. Conduction of the interview

The interview in this study was carried out following two phases. The first being the preparatory phase and the second being the interview proper.

3.7.4.1. The preparatory phase

During the preparatory phase, third age persons who met the inclusion criteria and were considered were met in order to plan how the interview sessions will be carried out. In this first phase, we equally scheduled meeting days and time with each participant before the interview proper, in accordance to their availability. It was at this level too that the objectives of the research were communicated.

3.7.4.2. The interview proper

The second phase also called the systemic phase was the phase of the interview proper. A semi-directive interview was carried out with each participant with the help of a thematic interview guide toward which we referred ourselves to throughout the course of the course of the interview. Questions in relation to the guide were presented before the participants who were free to expatiate as much as they wanted basing themselves on their personal opinions or personal experiences.

For the proper functioning to the interview, we made use of questions reformulation techniques amongst other interview techniques for better comprehension of the question, making sure that the participant had understood the question and is answering it. In cases where the subject

went out of topic or diverted from the initial question or theme, these techniques brought them back on track. The interviews were carried out in the participant homes. It was usually at hours when their kids or grand children would be absent or at sleep for. The environment during the interview session were free from distraction to enable them focus proper. Considering the ages of participants, we had 3 sessions with each participants with each session lasting from 15 to 25 minutes at most.

Participants were encouraged and reminded of the confidential nature of the exercise, making sure that they are still willing to go on with the sessions. They were reminded of their rights to leave or end the session at any point if they no longer felt comfortable and wanted to withdraw. For the data collection itself, a recording material alongside a notebook and pen were used to jot down pertinent answers, reactions, and bodily expressions prior a reply to a question. These were transcribed and later on interpreted.

3.8. ETHICAL CONSIDERATIONS

Researches in social sciences are mostly carried out on human activities, for this reason, our research was carried out following the strict respect of the participants as persons regardless of the aspects we sought to acquire information on. Hence, this research was carried out with respect to the code of deontology. Our first step in respect to the participants in this study began with our demand for their free consent or agreement to take part in the research. Those who had turned down our demand were not forced to accept. All participants were free at any time according to their will and desire to put an end to the sessions or quit if they felt they did not want to continue with it any longer. Their decisions were followed by no risk at all, since, anything concerning them were by no means going to be used against them.

Regarding confidentiality, Participants' real names, pictures, voices, signatures and other aspects that could be used to identify them where not included in this study. Only clinical information such as their ages, rank in family, gender etc. were retain for the purpose of research. To assure the anonymity of participants, we attributed them with Letters of the Alphabet as means of identification used to represent them all through the study (from the transcription of the interview, to their analysis and to the interpretation of data etc.). At the end of every transcription,

every records concerning participants were deleted from recording devices to avoid theft or illegal publishing.

3.9. SKIMMING TECHNIQUE AND DATA CODING

Once the data collection phase or interviews with participants had been accomplished, we proceeded with the transcription of the verbal and gestural information gathered on the topic after each interview. For effectiveness, we first listened attentively to the records we had at our disposal once or twice, in order to get acquainted to the information it contained. Then we carefully brought forth the transcription of the content. The text we would obtain from this (verbatim or verbatim report) is raw data, which would be necessary during data analysis. To better apprehend the study's phenomenon, these verbatim are passed through the phase of data coding which allows us to give meaning to ideas.

3.9.1. Analysis grid

The table below presents in the form of codes, indices on statements gathered from the field. These statements allow us to observe the presence or absence of sought-after elements (modalities and indicators) from the discourses of participants during interview sessions. The modalities and indicators are presented on the grid as "themes" and "subthemes", the codes and their meaning vary depending on the indicators.

Table 3: Analysis grid

Themes	**Code**	**Subthemes**	**Code**	**Observations**			
				Present(+)	Absent(0)	Contrary (-)	Doubt (±)
Process (reciprocal interaction)	**A**	Interactions with persons	a				
		Interaction with objects	b				
Person	**B**	Disposition (his/her quality of mind and character)	c				
		Resources characteristics	d				
Time	**C**	Microtime	e				
		Mesotime	f				
Cognitive flexibility	**D**	Self-regulation	g				
		Adapted performance	h				

3.10. TECHNIQUE OF DATA ANALYSIS (ANALYSIS OF THEMATIC CONTENT)

For data analysis, this study uses the content analysis method which is the most widely used method in studying interviews and qualitative observations. It is a method that seeks to account for that which interviewees uttered in the most objective and reliable way possible. It consists of transcribing qualitative data, using an analysis grid, coding the information collected and processing it. In order words, it gives way for the description of survey materials and explores its significance.

We apply this method to the discourses as it aims at a rereading of messages, in order to replace intuitive and instinctive interpretation with a constructed interpretation, explains Bardine (1989). This process involves selecting, condensing, categorizing, grouping and organizing information so as to give meaning and allow for an informed understanding of the documents analyzed. Through it, we are able to grasp the exact meaning of interviewees' messages by means of their discourse in all its subjectivity.

Here, we proceed by a first phase of preparation, putting the data in order based on the content analysis through a transversal thematic analysis of all the data collected. The qualitative data is processed following the semantic point of view, which consists of studying the ideas of the participants interviewed (empirical analysis), by the words they used (lexical analysis) and the meaning they give it (analysis of enunciation).

This chapter on research methodology enabled the presentation and identification of participants, the strategies of data collection, including the presentation of the interview guide which was used towards participants in order to gather pertinent information for effective results. The chapter that follows will focus on the presentation and analysis of results arrived at.

CHAPTER 4:

PRESENTATION AND ANALYSIS OF RESULTS

The present chapter is devoted to the presentation and analysis of results, using the thematic content analysis of the various themes presented in chapter 3 above. The results will be presented through the life stories of each participant which will enable the researcher to situate participants in their historical contexts, such that, participants would be read beyond their words.

4.1. LIFE STORIES OF THE STUDY PARTICIPANTS

4.1.1. Case R

Case R, is a 68 years old widow, born in the East of Cameroon in the year 1954. She is from a family of 5. She grew up with her parents through whom she learned a lot on farming, cooking and other lady-like skills. As a young girl she would follow her mother to the farm, where she would not just observe how work is done, but would participate in one way or the other to the task at hand. Through this, she learned a lot on various foods, their values, their nutritious content, and how to grow them effectively. Leafy vegetables were the most popular crops planted in her village, so she grew up to love them as food.

Everything she needed as a child was provided her by her parents, among which, nutrition, shelter, education, but she also owes a lot to her surrounding, for they played great roles in her upbringing, habits and preferences. R's mother was a housewife and owner of two pieces of lands that she used for farming, while her father was a skilled hunter. R narrates that her love of meat and "green leaves" grew out of the professions of her parents, it was only at an adolescent age that she came to the knowledge of the riches in nutrients these foods items possessed and provided her all through.

She completed her primary school studies in a popular school in her village under the care of her parents, and then moved from village to town in search of further knowledge. It was at a Douala's secondary school name King Akwa's that she acquired what she went for. To R, this was the stage where she personally and willfully became responsible with her eating habits in that, her parents would rent her a room for a nine months period each academic year and sending her

monthly allowances until the end of each academic year. This money was principally used on her feeding, although she also used it for some other personal necessities and school needs.

She would use those in buying the food items she grew up to know as healthy for her, specifically the green leaves type, meat, fish and others. To R, these food items are perfect for an overall well-being, for females as it strengthens her in all way and enables her to keep fit, sharp, intelligent and flexible. For males, it does the same and increase that aptitude. For both genders she recommend a reduction in oil consumption especially with increase in age. In short, out of town, she was her own responsibility, so even in town her diet did not change much. R explained that the just mentioned food recommendations was transmitted to her through her multiple conversations with her big brother (doctor of the indomitable lions in those days) he said, eat enough green leaves, of all sorts and cut low on oil consumption…

This, she kept regardless of the amount of money she had in hand. Yes, she would sometimes have to eat beneath her satisfaction, but she made sure to eat the essential. She would cook food containing fish, meat, vegetables enough to last her at least two days even with a little amount of money. To her, the objective has always been food quality over food quantity. And food items were not expensive in those days as compared to these days", she explained.

Shortly after completing the class of form 4, R returned to the village where he got married a hunter as her father, very apt, she claims. To her he was so because, like her, he was watchful of his diet, since his work demanded that he be apt, skillful and sharp and flexible. Her husband showed her the importance of fruits, he was a drinker of fresh palm-wine too. R says that although her diet had been modified by as he grew, by her brother, husband and her surrounding near or far it had worked out for her good. She says she bore for her husband 11 healthy with no complications whatsoever, and that even though now she is of advanced age, she still does not suffer any discomfort, illnesses… she capable of walking from one quarter to another although she 68, she still carries out her normal activities, and her mind is still intact, as compared to her friends. .

To R, her well-being is thanks to her long-term disciplined eating habit, even now, she says she still maintains her eating ways and principles, for she has found complete satisfaction in it and the weight of old age does not weigh on her. She is certain to keep ageing healthily if she keeps her lifestyle as it is now and advises that it is never too late to start doing the right thing, older

people like herself should start eating quality food, and although sometimes they might be struggling with appetite, they can at least eat a little quality of food rich in nutrients, rather than forcing down large quantities of foods that are void of or barely contain minerals and vitamin or denying to consume anything at all. R says she is no medical doctor but she is convinced the foods she has been consuming all along has played a tremendous role in keeping her fit.

4.1.2. Case E

Participant E is a female Cameroonian from the North West region of Cameroon, who recently turned 66 years old. She is the first child in a family of 7 children, a teacher by profession but now retired. Case E was initiated at a tender age into knowing the benefits of good feeding and how to use it to her advantage. As a result, she grew up strictly practicing healthy feeding. As the first child and only girl among 6 boys, her mother took time to transmit to her every necessary information of she needed to know on the topic. Her parents were strict about what she and her brothers ate when they were not home, for example, what they ate at school canteens. Case E explained that all of these build in her a strong habit that cannot be broken even now. It has become a lifestyle to her, a lifestyle with tons of benefits, benefits money cannot buy- benefits at the physical, mental, and even spiritual level, as she claims.

She, like her number one influencer (her mother), knowing and living the importance of nutrition, took on herself to pass it down to her children as well, regardless of their genders. As a married woman, she says she had the opportunities to learn even more, as she made friendship with fellow women, and the TV helped her with new ways of coking certain new dishes, and with new recipe she did not hesitate to try. Her husband is more of a consumer, he has no preferences, he likes everything she cooks, but she says she is able can see its effects. Despite his demanding job, he remains fit yearlong. I brought him into drinking tea also.

Case E in talking about herself and the importance of food to her well-being, mentions that she rarely consumes pharmacy medicines, in case of any discomforts from an infection, whether affecting herself, the children or her husband, she knows how to compose her own treatment using some particular leaves from a variety of fruity trees, such as mangoes, pawpaw, pear, guava trees, to list but a few. To her, natural is remedies are better and very effective. Case E says she can boast over the power of the right food. Although people worry about the dose, she says that it works wonders and usually there are no secondary effects unlike pharmacy medicines. She usually also

recommends food as medicine, and she emphasizes that all of what she says is what she practices, nothing is made-up. She says her husband who is 72 years of age, although a little bit tired, still have all his senses and mental capacities, we maintain good communication, and our conversation are fluent, he does not seem to be missing on something and neither do I.

4.1.3. Case S

Case S, is a 65 years old married woman born in 1957 in the North West region of Cameroon. At a young age, she worked as a caterer, providing food service during ceremonies in various sites. S states that this job allowed her to get into contact with many famous lifestyle and feeding habits, broadening her knowledge on the topic. She would be curious and ask lots of questions during the service breaks and get pertinent answers from them. It is through this on a part that she built up her own humble quality lifestyle for to her. To her, having a quality life and eating healthy is not a question of having too much money, with the little one has, he can eat healthy. Variation of food items being a good start, however, having knowledge the nutritious value of food stuff is a guideline that safes from unnecessary expenditure.

Case S got married in her mid-20s, there she learned a lot too from being a housewife, and compares being a housewife to being in a homeschool. Where you have to learn the preferences and choices of your partner, and endure the ways of families and family- in-law when they come in cases like child birth. But there too she learned all through and now she is proud to say she has a fix way of doing things, and because she is seeing results with those, her children have incorporated her ways. S looks way younger than her age, and says she sometimes takes supplements just to boost things up, especially after going through type of stress. He would consume peak milk and supplements rich with certain minerals. One of her daughter overseas sends her those sometimes.

Case S is totally for the fact that a quality dietary intake plays effective roles on ageing persons, mental, physical and even social life. She testifies of its impact on her personally and confirms it on her husband. As it has completely changed him. She recalls struggling with his feeding choices, but when he came to accept her feeding behavior, he himself tells her of how people congratulate him and make reference to the fact that his wife is feeding him well and it is very obvious.

4.1.4. Case T

Case T is a retired male Cameroonian born in 1957. Recently, he had lost his wife to a road accident, and claims she was the one who knew what was good for him in terms of life quality and feeding. However, T says he is the type who buys fruits every evening as he return from work, he is a great lover for Hausa's type of fruits such as dates and other unpronounceable fruits which he knew were rich and nutritious. Those too he would bring home from work whenever he had the chance to. T says he knew feeding was good for his children but did not know it was particularly important for ageing people or people his age. But he did not suffer anything much because his woman was in charge of his own feeding, and she would sometimes make him eat things that tasted terribly awful claiming it was good for him. She had some special recipes she made depending on the seasons.

Case T now lives with his children at home, they are the ones taking care of him. He still carries on is fatherly duties, although they are grown u already, sometimes he still takes his children out to places such as restaurants as it was the case when his wife was still resent. His older daughter who always was with her mother in the kitchen is the one currently caring for him. She would prepare him is tea daily, because he is a tea drinker. To participant T, he is okay with living well and feeding well, he is still very active and thinks it is partly due to his feeding, but also due to several other aspects. He names among others staying physically active, he mentions gene factors and environmental factors like the type of jobs and mindsets of the surrounding where one grows among others. However he states that feeding is among is a key factor to sustaining all the rest, as such it is it that maintains brain, physical and global health in the person.

4.2. ANALYSIS OF THE RESULTS

The thematic analysis involves the data reduction process and it is also used to summarize and process its corpus through the use of denominations labelled themes, and sometimes subthemes in reference to the breaking down of certain themes. The aim is using these themes to answer the typical generic question: "what is fundamental in this subject, what is treated in this text?"

4.2.1. Process (reciprocal interactions)

Process in this work constitutes the various forms of interactions an individual can have with his environment that will push him to adopt a given behavior or not. Interactions can be between persons, between persons and their immediate surroundings, or between persons and the objects in their surroundings. For persons of the third age, such interaction can determine their eating habits which may in turn act on their mental flexibility overtime, and of course maintain their autonomy and dependence at that age. This is explained in that environmental factors have been playing major roles in the eating habits of older individuals at several levels including the interpersonal level, which involves interaction with significant others and their eating habits. Social relationships also expose older adults to objects like smart objects which aid in information and knowledge acquisition. At the community level feeding quality may be influenced by food availability and food access for older adults. Health information, such as the knowledge of health risk in regard to food intake can be acquired through interactions with medical doctors or and other significant other, which in turn may occur t too influence eating behaviour. Implying that the social environment and community have the potential to modify older adult's eating behavior in desirable directions. Also, consistent health information conveyed through various media or health professionals may encourage older adults to adopt healthy eating behavior.

In all four participants, process, also called reciprocal interaction (Aa+) transpires through their speeches in that communication with others, observation of others' lifestyle; and the use of smart objects, including modern kitchen utensils have caused them to follow particular eating habits in one way or the other. Habits that have allowed them to see significant results.

Communication with others: the various interactions individuals have with their immediate surrounding have impacted, modified or caused them to abide to certain eating habit seen as appropriate. Participant R for example states that:

> Almost everywhere in the village you'll find "green leaves"...
>
> You eat them because that is what is available and that is what
>
> everyone else eats, and you can see that everyone is healthy,
>
> even the old, so you maintain the feeding style.

Although I ate that as a child without questioning, I came to discover the value and riches of these food through the multiple conversations I had with my brother who was the medical doctors for the indomitable lions. He told me to keep it up, he said eat green leaves (legumes) of all sorts and cut down on oil. I actually learned about reducing oil consumption through him and it has done me well (Case R)

My mother had always been careful about the type of food we eat, so much so that it became part of me. In my own marital home, I don't joke with food, I make sure the entire family consume essential food for their well-being and their health. I interact a lot with fellow married women as a young married woman and even now. I gained more knowledge on how to make the best dishes for my husband and kids, and also make sure that they learn for themselves (Case E).

I know all these things. As a young girl I worked as a "service traiteur", due to this I was constantly in contact with all sorts of foods, menus and styles of preparation. I asked a lot of questions, that is why I can tell you a lot about balanced diet, quality food, table presentation and even table manners (Case S).

Even though a man, I liked the taste of African spices in my food, as a young man my mother would make sure the appropriate spices enter the appropriate soups. Once married,

> communication between my wife and myself brought us to an agreement. She adds spices where necessary, but I also had to trust her when she cooked certain foods with none (Case T).

Interaction with objects: the use of smart objects (Ab+): with the outbreak of technology, smart objects like phones, television, smart kitchen utensil like blenders, have ease life in many aspects. Leading to the modification and/or the adoption of certain living and feeding style. As seen in the verbatim below:

> Things are easy these days, at first, our parents would think twice about cooking certain foods like “banane malaxée” for example because the groundnut would have to be ground on a grinding stone. And the food cooked were in very large quantities, in big pots for a large family including extended families, so you can imagine the quantity of groundnut. But nowadays, there are grinding machines everywhere, with 50 frs, your groundnuts are ready to cooking. So, we have almost no excuses- life has been made easy for you, but the choices most of us make are poor. Me for instance I am now in this thing called smoothie, you blend some food items and drink (Case S). Food helps in many aspects, what I have also been doing is recreate foreign dishes. There is this channel on Tv that shows interesting foreign dishes that seemed delicious and easy to reproduce. I began attempting those at home a few years into my

> marriages. I like cooking and I now like experimenting with new foods too (Case E).
>
> Some of these tools make life easier, and practical, you don't feel lazy to do something for yourself because half of the work will not require your energy (like breaking firewood. We use use gas-cookers instead, although not all the time, sometimes it is stove and kerosene too. For food that stay too long on the fire, or need a lot of heat, like "coki-corn", we light up 3 stones fireside like in the village. When I am in town I use available utensils, when I am in the village, I use what is there (Case R).
>
> My children who are presently taking care of me, know of my taste and try providing me with the necessary. Although they are grownups and busy, the fact that there's a modern kitchen eases their works a big deal. And although I don't like sweet things, because there is an oven, every weekend my girls try new cake recipes (Case T).

Feeding behavior and knowledge on what is best to practice for one's wellbeing and mental flexibility with advance in age, as seen above were influenced by environmental factors, interactions with others and objects.

4.2.2. Person

Person comprises characteristics like predispositions and resources. Predisposition seen as those dynamic personality traits that can either promote interactions or interfere with their occurrences, while resource characteristics are those biological, mental, motivational, financial, experiential resources that may either encourages and facilitate or discourages and impedes the process of following a healthy diet. Person here refers to among other, personal dispositions as

described by the quality of mind of individuals are capable of determining the character that would result vis-à-vis a situation or task. It also refers to the availability of resources both bioecological resource characteristic equally play a role. For instance, the presence of financial resources to meet up with a certain diet; the motivation to carry-on or begin a certain regiment are undeniable determinant factors intervening third age persons eating behavior.

In participants, the role of person vary between participants as a theme is seen in their discourse that follow. The indicators (Bc+ and Bd+) are seen in cases R, E and S.

> I took the advice. I like good things. When it comes to keeping fit, I am in. Also, when you are conscious of the risks and benefits of a thing, your reactions revolve around it. Who likes falling sick? So you do what is necessary. When you know what you would gain, and when you know what you may lose, it is left to you to decide (Case R).

> Hmmm! these fingers are not the same, I don't know about others' styles, their beliefs, their experiences, or their preferences. But I know that doing the right thing produces the right results. I personally am opened to learn, especially when it comes to health. Although I left school since, I know some foods are good for the brain and memory, so I invest on them for myself and the whole family. For instance, when exams periods were approaching, as a student, I would make sure to eat some fried corn and ripe bananas – as my mother would often give me those. For my children I added black chocolates. There's a lot to gain behind food… the right food can stimulate the brain and

> keep people sharp. That is why I am fully disposed to learning and practicing (Case E).

> Good food doesn't mean you should have much money, with what you have you can obtain a healthy diet and all its outcomes. People should understand that good food is not all about meat, chicken… let us stop being ignorant and focusing on that alone. It is okay to ask around for advice as you are doing right now, to learn more on how you can get the best out of the food you eat. Anyways all of these begins from the mind, if someone does not believe that what he eats, makes him who he is, then no matter what you say, he will put no efforts into practicing a good eating behaviour. But I tell you that eating well is important for everybody, especially babies and the old (Case S).

Interest in anything motivates those it concerns to put more efforts into acquiring the thing or learning more about the thing. This is what happens at the level the indicators: disposition and resources.

4.2.3. Time

Time here comprises the microtime and the mesotime. The microtime which is that one that deals with all that happens during the reciprocal interaction level (the process modality) or activity. In other words, it deals with the extent to which there is continuity or discontinuity in older adults' activities or interactions. And the mesotime refers to the extent to which these interactions occur over days, weeks, months.

In our participants, the question of how long habits developed from social interactions have been practiced or should be practiced for effectiveness is often summarized to always (all the time).

For, as they say, the effects affect and are affected by processes and outcomes of human development over the life course, as such should be maintained all through. This is to imply that, regarding the quality eating habit lifestyle, there is the need for consistency to see permanent results. The participants' speeches fall in line with time (Ce+ and Cf+): madam E says "long-term practices is necessary, I have been eating good all my life and I don't see why I should stop now. Also, we all eat every day, why not chose to eat good?"

> From my young age, I started practicing eating well. Like I said before, many people in my surrounding were eating well, even the old in age did not seem old. My big brother had advised us, even though he is no longer practicing as a doctor now. He said eat green leaves of all sorts, reduce oil consumption. So I started that lifestyle since, when i had not yet given birth. And I am confirming its good deeds… I don't suffer from pains, Even now I am still in it because I see results. There is no time limits, be consistent with it, it costs you nothing or not too much, but you will gain everything (Case R).
>
> We eat for survival, we eat daily for that purpose. No one can say he has eaten for one month so that he will live forever. That is why I began by contrasting good food to malnutrition. If you eat, you will live because the food will keep you alive. If you eat an unbalanced diet like rice every day, you will still live but you will develop some deficiencies. Now imagine you eating quality food daily, well balanced and full of nutrients, minerals and vitamin… you see that you have the answer to your worries now my daughter (Case S).

> My control over diet and the type of food I eat is primarily in view of maintaining the right shape, avoiding overweight. As a youth I was very fat, I started working on my body composition as a young man around the age of 18 years old. I had cut down on alcohol, so that I don't develop big belly. Now it has become a habit. A daily practice all year round (Case T).

4.2.4. Cognitive flexibility

In this study, cognitive flexibility in third age persons is the ability they have to continuously adapt to changes occurring in them and around them, enabling them to maintain their autonomy and independence through flexible abilities, such that as they live at home they are not a burden, but can still play the role of a parent.

For our participant, it is mental flexibility that makes them to be capable of modifying their knowledge and habits in order to adapt to new eating situations or to maintain already present eating styles. It equally increases attentiveness which benefits social interactions and eases adaptation to the social environment and by so doing boosts self-confidence. This is seen in participant E and S. in regards to adapted performance, with indicators comprising- behavior modification and both goal-oriented behaviour (Dh +):

> In my own marital home, I don't joke with food, I make sure the entire family consume essential food for their well-being and health. I interact a lot with fellow married women and gain more knowledge on how to make the best dishes for my husband and kids, and also make sure that they learn for themselves. Eating well has become a law for us. We eat three times a day, even when there is not enough, we still chose quality over quantity. That's how I brought up my children (Case E).

> When I saw such, I would ask questions at the end of the ceremony to understand why such in a ceremony like that one. They give various reasons but somewhere along the line they will mention its nutritious qualities. The answers they gave served as guidelines for me. So I kept learning, i don't resist knowledge. But I embrace what is good, and pay no attention the rest. I also went by trials and errors sometimes, when something works well, I incorporate it. I have a note book in which I keep every key recipe, clearly stating its riches and benefit. My plans was to open a restaurant (Case S).

Cognitive flexibility aids in the development of thought, reasoning and the acquisition of new knowledge. It is also useful in the –identification of errors and the appropriate process of solving them. In brief is fundamentally involved in our capacity to adapt to the predictable or unpredictable circumstances encountered by participants. For participant T, his issue with weight was identified due to cognitive flexibility and as an adult he worked toward maintaining the shape he had got and was satisfied with.

> My control over diet and the type of food I eat is primarily in view of maintaining the right shape, avoiding overweight. As a youth I was very fat, I started working on my body composition as a young man around the age of 18 years old. I had cut down on alcohol, so that I don't develop big belly. Now it has become a habit. A daily practice all year round (Case T).

Self-regulation: identification of an error and appropriate process of change are determinants of cognitive flexibility as observed in case E above (Dg+).

This chapter aimed at the analysis of results obtained through interview using the semi-directive interview towards participants. These results will be interpreted in the chapter that follow.

CHAPTER 5:

INTERPRETATION OF RESULTS

This chapter aims at bringing an interpretation to the results obtained in the previous chapter. To achieve this, we will work through the light of the various theoretical reference model used in this study. The stages consists of translating the qualitative results into usable knowledge in accordance to the research problem, and showing how it contributes to the understanding of the phenomenon studied. This chapter equally aims at identifying and showing the significance of the results, evaluating the implications, among others. Below, we will present a review of the empirical and theoretical data, the interpretation of results and perspectives.

5.1. REVIEW OF THEORETICAL AND EMPIRICAL DATA

5.1.1. Review of theoretical data

The bioecological systems theory reveals with Bronfenbrenner (1986) that humans actions as they develop is a transactional process wherein they are influenced by interactions with various aspects and spheres of their environment. The question of how the environment affects feeding lifestyle of the aged, as it is the preoccupation of this study follows the "process-person-context-time" (PPCT) model where Bronfenbrenner explains that a person's development can be changed overtime within certain environments. Defining the individual at the center of the system with time being the major driving factor of change. A phenomenon that extends over the life course. For the purpose of this study, we focus on the process, person and time factors of the model only in order to understand how mental flexibility is maintained and/or improved with quality feeding lifestyle.

As a person lives in his environment, he tends to interacts with it. This is what Bronfenbrenner terms, process or proximal processes or reciprocal interactions, and they are the primary mechanisms producing human conduct or lifestyle. Implying that the reciprocal interactions that the third ager has with persons and objects in his surroundings or environment is at the base of quality of life. Therefore interaction become the primary source of information and education he obtains on the matter. As ages or time come and go, these process' complexity become more complex as well.

Dispositions or predispositions; resources; and demand force are characteristics that when found in a person promotes their interactions with the environment or interferes with it when they are absent. Dispositions and resources are characteristics of "Person" in Bronfenbrenner's PPCT model. Dispositions determines how determined a person would be towards a given task or goal while resource characteristics are those biological, mental and experiential resources that individuals bring to proximal processes. Demand although not used in this study, is on its part those daily factors capable of discouraging or encouraging reactions from the social environment.

Then time is the last construct of the PPCT model comprising the microtime, the mesotime and the macrotime. The extent to which there is continuity or discontinuity in older adults' activities or interaction with the environment is known as the microtime. And the extent to which the proximal processes occur over days, weeks, months is the mesotime, while the macrotime which is similar to the chronosystem focuses on those changing expectations and events occurring in the larger society within and across generations, as they affect and are affected by processes and outcomes of human development over the life course. For the purpose of this study, emphasis is laid only on the first two time factors mentioned above.

According to the model, age differences shape the context in which individuals function and therefore also influences health behavior, health risk, and choices directly and/or indirectly. This theory identifies multiple points of possible intervention from the biological level to the environmental level to postpone the risks of diseases, disability and enhance the chances for health and longevity.

Bandura (1986) social cognitive theory (SCT) on its part makes use of both environmental and social factors to explain health-related behavior, which in the case of this study is individuals' quality feeding behavior. Hence, moving beyond individual factors. Based on the triadic reciprocal determinism, the SCT emphasizes that what people think impacts their choices. The basic regulatory principle of the SCT is the reciprocal determinism which represents a continuous and dynamic interaction between the individual, the environment and behavior. Such that, a change in any of these factors will affect the other two.

Bandura conceptualized the effects on human behavior including

the concept of human in terms of basic human capacities that are

> cognitive by their nature. Key concepts associated with the person include: personal characteristics, emotional arousal/coping, behavioral capacity, self-efficacy, expectation, expectancies, self-regulation, observational/experiential learning, and reinforcement. The Social Cognitive Theory also highlights the importance of cognitive and behavioral skills in building health behavior changes. For this reason, smokers who want to quit smoking but lack the necessary cognitive and behavioral skills to cope with stressful situations without smoking in the future are less likely to be successful in changing smoking behavior, no matter how enthusiastic they are (Redding et al., 2000).

In this light, older people, in view of ameliorating their quality of life and feeding behavior will consider the influence of their immediate environment and their individual characteristics in order to perform behavior by allowing subjective thoughts to merge with the environmental to produce result. As mentioned previously, using the social cognitive theory as a framework, adults can therefore work to improve their health states and quality of life by correcting their faulty self--beliefs, thinking habits, etc., boosting their self-efficacy (personal factors), they will have to go further to improve their self-regulatory practices (behavior), and equally alter structures in their surrounding that may work to undermine their end results (environmental factors).

Ajzen (1991) Theory of Planned Behavior (TPB) is a modification of the Theory of Reasoned Action (TRA) which was based on the assumption that behavior is controlled by will and people are rational. The TRA was designed to predict behavior by looking at the intentions behind the actions. It claimed a mathematical relationships between beliefs, attitudes, intensions and behavior (Redding et al., 2000). To these is added perceived behavioural control under the umbrella of the TPB. The theory holds that the intentions of the behavior affect the behavior. The three main variables that affect the intention are subjective norms, attitudes and perceived behavioral control. Subjective norms involve an individual's assessment of what significant others

think of his or her ability to undertake a behavior. The intention of this individual is partly determined by the idea of a anyone who could be a role model. Attitudes can be conceptualized in terms of values. In other words, a set of values can be developed in relation to behaviors. For instance, “healthy eating is a good way to prevent or even improve cognitive flexibility decline (Redding et al. 2000)

The individual in view of deciding to carry out a behavior, takes into consideration every information at his disposal, evaluates the implications of carrying out the act and the consequences that may come forth. Hence, his decision is a reasoned, planned and controlled one. Which explains the idea of applying this theory in the domain of quality of life and healthy eating, depicting the main psychological causes behind behaviors, and this knowledge will provide valuable information that can be used for predicting and influencing behavior.

In the light of all these theoretical information, we understand that for cognitive flexibility in the third age person to be maintained or improved such that autonomy and independence is maintained in old age, there is need for a quality feeding style regiment to be put in place. The environment has an undeniable role to play and so do the factors involved in proper behavior change or modification. The aforementioned theories’ objective is to develop competences that would enable autonomy and independence through their educative and transformative abilities. They simply explain that when an individual has a favorable attitude towards a given behavior, the resources, alongside environmental support and societal influences increases or reduce implementation or consistence of the behavior.

5.1.2. Review of empirical data

The analysis of the thematic content of participants’ discourse suggests that quality of life through feeding is achieved through reciprocal interactions (process) wherein participants acquire knowledge on diet and food items beneficial for fitness and mental wellbeing even in old age. Quality information is obtained through ions with other people and objects in the environment through communication with others (parents, friends, neighbor, children, doctors), Observation of significant others’ lifestyle, reading of books, testimonies including the use of smart objects like phones, the internet, Televisions. Participants attested that interactions with some modern kitchen

tools, utensils, and machines facilitated the incorporation of certain eating habit termed important for cognitive wellbeing. A practice that has eased and ameliorated their food-related quality of life.

In the beginning of a child's life, he has no control over what he consumes, but as he grows, he begins to interact with his immediate and farther surroundings. Through this kind of socialization, he observes and gets himself taught and informed, which allow him to build his own kind of life or lifestyle. In participants, repeated interaction with the environment enriched their quality feeding habits.

Person, which comprises the quality of mind/character of persons (dispositions), and their resources characteristics vis-à-vis the outcome of their interactions is spotted in participants' discourse. Once participants obtain new ideas or insights on perfecting their feeding quality through the assistance of reciprocal interaction, they become mentally and physically disposed to putting it into practice, by either modifying their already available regiment or dropping that which was not proper. This they do when it ties with their beliefs or culture, their perception of health situation and risks, responsibility, curiosity, experience etc.

When a person reaches that point where he is in one accord with a given proposal, he becomes mentally disposed to go through with it. Physically, he begins to make plans, he is conscious of the role he has to play, and he applies all of his personal skills for the success what he engages himself into. If this stage is attained successfully, he will be disposed to put in place resources for the accomplishment of the action. Resources can be biological and physical, involving financial means. Likewise the lack of disposition and resource to a given standard of life leads to the non-practice of that lifestyle. Mindset is key in any practice.

In participants, the achievement of quality results is obtained through consistence. Time is primordial and accounts for wellness. If anyone keeps doing the wrong thing over a given period of time, it will show. This is true too for brain health and flexibility. If the right nutrients and lifestyle are acquired by an individual over longer periods of time, the results will be visible and undeniable. Time factor is shown throughout participants' discourse, the microtime which deals with all that happens in the proximal process (interaction with the environment) is extended through the continuity or discontinuity in older adults' activities and interaction. The mesotime makes reference to the extent to which the proximal processes occur over days, weeks, months and

so. Expectations and consistency of practices over a longer time period produces solid results. Hence the best way to achieve quick results with a quality life style requirement is to keep the practice going.

All participants testify to the satisfactory strength they are in at their current age, and emphasize that it is thanks to their consistent strict feeding regiment. It is equally doable in a country like Cameroon where markets are full of varied quality food item mostly directly from farms. Such availability eases the search items and ideas on where to get them. The social environment has much to offer. The more one is exposed to its riches, the better he becomes. The analysis of the contents of participants' discourse allows us to understand that cognitive flexibility in third age persons is maintained and even improved with consistence in good feeding quality of life. Negligence of nutritive values' role in advance age may lead to advance decline in mental flexibility and overall wellbeing.

5.2. INTERPRETATION OF RESULTS

In view of the interpretation of results through the hypotheses stated earlier in chapter 3 above, it is reminded that the aim of this study is to get better understanding of the phenomenon studied and not to confirm or infirm the hypotheses.

5.2.1. From process (reciprocal interactions) to cognitive flexibility

Process, known too as proximal processes or reciprocal interactions constitutes those interactions that individuals have with the external world. It is those interactions that third age persons will have with their environment that may modify or construct their manner of doing things (their manner of feeding). Process is a social tool that enables participants to build a lifestyle. It was describe by Bronfenbrenner (1986) as those interactions that have effects on human conducts and development.

Through interactions, people get opened to new ideas, new ways of doing things, new ways of approaching situations, and new ways of dealing with issues. Environmental factors influencing the feeding habits of third age persons could be understood through various interpersonal influences, comprising social relationships with other persons, and the adoption of feeding habits of persons considered significant and important. This is observed in participants discourses:

> … I came to know the value and riches of this food when my brother who was the medical doctors for the indomitable lions told us to keep it up. He said eat green leaves of all sorts and cut down on oil. I actually learned about reducing oil consumption through him. It was him who told us to cut down on oil... My brother taught me a lot, each time he visited, we would discuss on the topic.
>
> My husband taught me some things also, he was a very apt man, a hunter, he came with his own eating habit and I adopted it too. I learned a lot with my interactions with these two men. Now I am the one influencing my people around me, many people in the village come to me for advice on various topics: foods, medicine, and childbirth. (Case R).

Interactions by itself boosts flexibility and gives access Interactions (process) also go as far as getting access to information and knowledge on a subject matter, broadening understanding, building skills, complementing already available ideas. All of which are observed from the discourse above. Implying that interactions with the environment is a means to obtaining healthy feeding and feeding ideas in older adults of the third age range in view of reducing the decline of cognitive flexibility that comes alongside ageing, and improving it in view of maintaining autonomy even with yearly increase in age.

It is already known that an important actor in improving healthy ageing is adequate food and a nutritional balanced diet (Stough & Pase, 2015). Therefore the social environment have the potentials of changing third aged adults' feeding behavior in desirable directions such that they remain autonomous and independent during this age. This is confirmed when Bronfenbrenner (1977, 1986) talks of proximal processes as the reciprocal interactions taking place between a human being and one or more of the persons, objects in his immediate environment. His

foundational belief is that a person is the product of both their biology and the impact of the environment. As seen in the discourses that follow.

> What I mean is that my mother had always been careful about the type of food we eat, so much so that it became part of me. In my own marital home, I don't joke with food, I make sure the entire family consume essential food for their well-being and health. I interact a lot with fellow married women friends here and abroad and gain more knowledge on how to make the best dishes for my husband and kids, and also make sure that they learn for themselves. (Case E)

> Me, I know all these things from my past experience. As a young girl I worked as a "service traiteur", due to this I was constantly in contact with all sorts of foods, menus, styles of preparation etc. For example, in an important party or ceremony, you'll see they cook "banane malaxee" and you may wonder why, but this food is a well-balanced diet. Rich in nutrients. It contains groundnuts, palm oil, dried fish or meat, with spices. Everything in a food such as that is very rich and good for health maintenance. When I saw such, I would ask questions at the end of the ceremony to understand why such in a ceremony like that one. They give various reasons but somewhere along the line they will mention its nutritious qualities. The answers they gave served as guidelines for me. And things are easy these days, at first, our

> parents would think twice about cooking certain foods like banane malaxee for example, because the groundnut would have to be ground on a grinding stone. And the food cooked were in very large quantities, in big pots for a large family including extended families. But nowadays, there are grinding machines everywhere, with 50 frs, your groundnuts can be ground. So, we have almost no excuses- life has been made easy for you, but the choices most of us make are poor. (Case S).

> I observe, I travel a lot, I went to school, I had part time jobs like the one I told you of. That's how I know what I know. However, I also learned a lot of things from being a housewife. Being a wife is like a school, when you are well loved, even your in laws will lick some secrets to bringing up a healthy home. For example, one of sister-in-law would visit each time I gave birth, and stay with me for over a week, and she would talk about these things whenever she had the chance. So I kept learning, i don't resist knowledge, even though sometimes it felt like she wanted to teach me how to handle my own house. But I embrace what is good, and pay no attention the rest. I also went by trials and errors, when something works well, I incorporate it (Case S)

"…my wife is no more, and at this my age, my children who seem to know me well, provide me with the things they know I like and those they think is good for me." (Case T).

As Scar (1992) observed, individuals have a unique way of understanding, constructing and taking action on environment. For these environmental reality is not acquired but constructed and each individual's construction of reality is unique. Case S says: "But I embrace what is good, and pay no attention to the rest. I also went by trials and errors. When something works well, I incorporate it."

Which implies that although she is opened to learning, not every information she gets from the environment through interaction is incorporated.

> Proximal processes are not simply the unilateral effects of environment doing things to people. They are more than the interaction of two individuals in direct communication. They are also interaction with objects and symbols that make up a context. Just as proximal processes are not limited to interactions with other people, It is also obvious that simply the presence of other people in the immediate environment does not necessarily lead to the occurrence of this process (Griffore & Phenice 2016)

Mercon- Vargas et al. (2020) talk of Inverse proximal processes. This to mean that interacting in itself would fully lead to cognitive flexibility in the age person. But it is a means to an end and not an end in itself. Bronfenbrenner and Morris (1998) explained:

> Especially in its early phases, but also throughout the life course, human development takes place through processes of progressively more complex reciprocal interaction between an active, evolving biopsychological human organism and the persons objects, and symbols in its immediate external environment. To be effective, the interaction must occur on a fairly regular basis over extended period of time. Such enduring forms of interaction in the immediate environment are referred to

> as proximal processes. Example of enduring patterns of proximal processes are found in feeding, problem solving, learning new skills, performing complex tasks… (Bronfenbrenner & Morris, 1998).

Bandura (1986) talks of the reciprocal interaction between the person, his environment and behavior, putting emphasis on internal and external social reinforcement in which individuals may perform the actions/behaviour. In this sense, the persons' past experience is taken into account which in turn influence reinforcements, expectations. All of which together shapes a person's engagement to a certain way of life and hence, plays important roles in their flexibility and autonomy maintenance.

5.2.2. From person to cognitive flexibility

Person, which refers to the personal characteristics of individuals greatly impacts the manner of interaction of an individual towards people and objects in his surroundings. It also influences the manner in which individuals react and behave mainly through the influence of the social environment. Person is comprised of characteristics linked to personality, resources, disposition and demands. They can either promote interaction or interfere with their occurrences.

Resource characteristics are those biological, mental or experiential resources that individuals bring to proximal processes. Demand characteristics are those easily visible factors that can invite or discourage reactions from the social environment and so facilitate or impede the initiation n of proximal processes. Bronfenbrenner and Morris (1998) explain that "in proximal processes involving interpersonal interaction, it is the personal characteristics that influence the power of the process." Which means that it is the "person", his quality of mind, his physical appearance, alongside other personality traits and characteristics that acts on the success of reciprocal interactions and hence produces results.

Rosa et al. (2013), explains that Bronfenbrenner's Person-context model moves beyond social address because they include participants' person characteristics under consideration. Participants in this study made reference in their discourse to their personal desires which allowed them to go forward with their food-related quality of life standards. Case E in mentioning her personal disposition in going forth with her beneficial feeding habit said:

> I personally am opened to learn, especially when it comes to health. Although I left school since, I know some foods are good for the brain and memory, so I invest on them for myself and the whole family. During exams periods, I made sure to eat some black chocolates, I ate fried corn and ripe bananas. There's a lot to gain behind food, I guess concerning the old you talk about… food can keep them sharp too.
>
> … Teas have the ability of giving some sort of freshness to its drinkers. I like trying new trying new things.
>
> … she taught me everything, and when I have an opportunity to learn, I do. Food have unbeatable riches, they can prevent illnesses, cure them, maintains health, regulate the body, controls many things in a person, even the brain health etc. Knowledge of the right food to take is so important for the whole family: babies, toddlers, adolescent, adults, everyone. People do not know this, they think of food as that which should be eaten to prevent death alone. (Case E).

As seen above, dispositions, comprising the individual's quality of mind, and their resource characteristics account for cognitive flexibility of third age persons in that they determine how a person respond to others and objects in their surroundings during proximal processes. The "person" characteristics is made prominent through the mental dispositions (beliefs, perception of health risks and benefits…), physical dispositions (seen in the role perception of the individual involved, personal skills application and plan of actions). Also, there are various resources that are put in place. Involving personal experiences and knowledge: anticipations responsibilities, feelings; and

physical appearance (age, gender, handicap, curiosity, self-efficacy, self-worth and much more). The other participants display their personal dispositions towards the matter when they say:

> Failure to eat a balance diet leads to malnutrition. Good food doesn't mean you should have much money, with what you have you can obtain a healthy diet and all its outcomes. People should understand that good food is not all about meat, chicken… lets stop being ignorant and focusing on that alone. It is okay to ask around for advice as you are doing right now, to learn more on how you can get the best out of the food you eat.
>
> … Anyways all of these begins from the mind, if someone does not believe that what he eats, makes him who he is, then no matter what you say, he will put no efforts into practicing a good eating behaviour. But I tell you that eating well is important for everybody, especially babies and the old. Those two categories of people need the best of food to grow well. Yes, the baby needs nutritious foods for his body, soul and intelligence development, while the old needs it to keep it. These sickness that you say old people have that make them forget things, why did our parents not have those? They fed well. (Case S).
>
> I buy them when I see them, actually I buy those things because they are rich in nutrients, and they are rare to find. So when I have the chance to buy, I buy. Although sometimes I see them when I

> don't have enough cash on me. So yes, resources matter too, money. But having the desire is a plus already. (Case T).

To Ajzen (1991), individuals' behaviours are driven by behaviour intentions that causes them to perform those. Depending on the attitude they have toward behavior, there is high chance will be practice with consistency so as to produce results. These intentions consider cognitive self-regulation as that which plays important roles in overall results. His theory therefore explains that when individuals have favorable attitudes towards an eating behavior or quality lifestyle, he will be motivated and consciously plan on how to perform those. Meaning that the stronger the intention, the more likely the behaviour will be performed.

Bandura's social cognitive theory on its part lays emphasis on the individual's perception of his capacity to produce a desired result toward a task. It focuses on a person's personal efficacy. Bandura uses the term "self-efficacy" to refer to a person's self-judgment on his capacity to act on himself, on his surrounding and on others when faced with a specific situation (Carré, 2004, p. 14). In other words, it is the person's belief on his competence in regard to change and personal development on the one hand, and his beliefs in regards to his intervention capacity towards other persons or things, on the other hand.

5.2.3. From time to cognitive flexibility

Time is the final construct of Bronfenbrenner's PPCT model. It is comprised of three instances, the microtime which deals with all that happens in the proximal process including the extent to which there is continuity or discontinuity in the older adults' activities or interaction; the mesotime which refers to the extent to which the proximal processes occur over days, weeks, months. In other words, it is the current time which describes the immediate weeks and month that participants are moving through. In brief, it checks consistency. Seen when Bronfenbrenner and Morris, (1998) say:

> …To be effective, the interaction must occur on a fairly regular basis over extended period of time. Such enduring forms of interaction in the immediate environment are referred to as proximal processes. Example of enduring patterns of proximal

> processes are found in feeding, problem solving, learning new skills, performing complex tasks… (Bronfenbrenner & Morris, 1998).

"Process" operates over time and are posited as the primary mechanism producing human development, however, the maintenance of a quality lifestyle in view of mental or brain health in older adult is good, but initiating the behavior or lifestyle and being consistent is primordial.

> … And since then, I have practiced that, since before I got married and started giving birth.
>
> From my young age, I started practicing eating well. Like I said before, many people in my surrounding were eating well, even the old in age did not seem old. My big brother had advised us, even though he is no longer practicing as a doctor now. He said eat green leaves of all sorts, reduce oil consumption. So I started that lifestyle since, when i had not yet given birth. And I am confirming its good deeds… I don't suffer from pains, Even now I am still in it because I see results. There is no time limits, be consistent with it, it costs you nothing or not too much, but you will gain everything. (Case R).
>
> To benefits from all the nutrients in food and fruits yearlong, we follow the practice of eating according to seasons, it is easier for us that was. What I mean is, for example, when it is the plum reason like now, we eat plums, when it was the mango season, we

> ate those etc. That's how we make use of food and gain its richest nutrients each time. Till now, it has not failed me. (Case E).
>
> Long-term practices is necessary, I have been eating good all my life and I don't see why I should stop now. Also, we all eat every day, why not chose to eat good? (Case E).

The concept of the influence of time is not new to any area of human development or conduct. It is good time to reflect on just how much our current time will impact our time ahead. In the bioecological model, Bronfenbrenner and Morris (2006) integrated and described time as an element that exerts influence on development over the lifespan and even across generations. Bronfenbrenner explains that a person's development can be changed overtime within certain environments. Defining the individual at the center of the system with time being the major driving factor of change.

5.3. PERSPECTIVES

Since this study was carried out in the center region, we suggest that this study on nutritive/food-related quality of life of third age persons in view of cognitive flexibility be carried out in different contexts in Cameroon. This would enable even more solid and reliable database for research and solutions on the issue of flexibility in older adult, such that autonomy and independence be maintained. We equally suggest that this study be carried out following the quantitative or the mixed research methods, as this types of research can be applicable to such a study as well.

5.3.1. Theoretical perspective

The theoretical analysis of the results based on the first hypothesis reveals that the two indicators account for cognitive flexibility in third age persons. With interactions with other people appearing to be of more weight ahead of interactions with objects. The exchanges that third age people have with other people of different ages, different cultures, different professions, different background, different educational levels etc. give more insights to less understood phenomena, and creates awareness on topics of great importance that may have been otherwise neglected or under looked.

It is in this sense that Bronfenbrenner (1998) believe that human development and/or conduct development is a transactional process in which individuals are influenced by their interactions with other people and their interactions with various aspects and spheres in their environment. So much so that, this in itself boosts their mental flexibility. This is important in that it gives way for an understanding through a systematic approach of human and social development. It equally provides links to why people, third age people included, each develop differently. And throws some light on how some aspects of development are in their control meanwhile others are not.

His works also tie with Bandura's (1986) SCT which asserts that human behaviour is held to be determined by factors like sociostructural variables, self-efficacy, outcome expectancies and goals. The social-cognitive theory is that theoretical perspective in which learning by observing others is the focus of study. It is grounded by several basic assumptions, one of them being that people can learn by observing others and people can acquire new behaviors and knowledge simply by observing a model or a significant other. Hence, most human behaviours are learned through imitation and interactions.

The theoretical analysis of the second hypothesis reveals that person appears like the variable that accounts the most for cognitive flexibility in third age persons. For, regardless of the insights one can get as he interacts with people of other nations, continents, background and eating habits, if he as a person is not predisposed to taking actions for his own well-being he is likely to remain ill-health as he was before his interactions. Brofenbrenner (1998) highlights predispositions at various levels (both the quality of mind of the person and his resources). For these factors are necessary for the implementation of various diets, eating regiments or feeding styles.

Ajzen (1991) talks of Planned Behaviours- the individual's decision to engage in a specific behavior, or to stop engagement towards a specific behavior. This possible through "intentions" which are largely influenced by an individual's attitude toward a behavior, the subjective norms surrounding the execution of the behavior, and the individual's perception of their control over the behavior. Ajzen's TPB is a psychological theory that links beliefs to behavior. Which is what characterizes third ager's dispositions or predispositions to acting on a eating style in view of the health results aimed for.

The theoretical analysis of the third hypothesis on its part grants an understating that time is an indisputable factor that plays an undeniable role in third agers cognitive flexibility.

Consistencies in health inducing feeding-quality of life with time shows of results both mentally and physically in the third ager. Likewise, poor nutritional habits would show too. Bronfenbrenner (1998) time factors runs over the chronosystem. He talks of the microtime and the mesotime to mean how long a person is consistent over longer period of time (from days to weeks, to months and years) with the habits he is practicing. Results with come forth whether good or bad with the passage of time. In the same light, persons desiring to modify their eating habits in view of betterment in their flexibility should expect that over a period of time, and not overnight.

5.3.2. Professional perspective

This study recognizes the importance of using knowledge on quality nutrition to maintain or improve the cognition of older adults as they increase in age by deepening knowledge on measures that can be used in maintaining cognitive flexibility in the elderly such that with advancing age, they are still very much healthy, autonomous and independent. Needing just little assistance where or when necessary. By so doing, contributing to the overall wellbeing of families and the society at large. Quality feeding in this study is presented as both a preventive and curative intervention for every ageing individual. As poor quality feeding is associated in the long term to frailty, dependence, health issues, and mortality risks.

As such at the professional point of view, this study is of great value in that it is not just limited to the field of special education or gerontology, but can be extended to fields and domains such as health, psychology, education to name but a few.

To healthcare professionals, this study is of great interest as it gives way for proper and deeper care for the aged. Which lines up with the UN's principles for older persons which states that "older people should have access to health care to help them maintain or regain an optimum level of mental, physical and emotional wellbeing and to prevent or delay the onset of illness." Quality diet can have a substantial impact on maintaining health, independence, quality of life in third agers. The public health sector can therefore use nutrition practices as an affordable effort towards the prevention and/or control of a large number of diseases that make older adults frail, vulnerable and dependent. As such, health professionals can use this study as a unique way to develop and maintain healthy eating habits in older adults in order to reduce health inequities. It is therefore a unique way to improve public health while promoting healthy ageing.

This can be of great use to professionals in psychology in that it relates to changes in cognition and emotion that have impact on subjective wellbeing, social relationships, decision

making and self-control that is observed in older adults. To psychologists again, knowing they focus on the study of behaviour and mental processes, this thesis may arouse some questioning on factors that impact eating behavior and nutritional status in older adults, and how answers to these can reduce brain degeneration and mental issues, given they are increasing in very fast pace. Psychologists play already play a significant role in addressing the mental needs of older people by providing services in private or group practices, focusing on the nutritive role of feeding in preventing pathological ageing is a plus.

The education sector is equally an area where this study can be professionally applicable. Ageing education in schools offer the possibility to teach basic knowledge about old age, ageing and all that is tied to it. Issues related to ageing are an imperative topic in the society, hence, adding it to the curriculum is essential and can serve as both a decision tool, and a means of sensitization towards awareness. How nutrition can aid with mental flexibility in advanced age, leading to general knowledge on the topic and more in depth researches for better tomorrow.

To the special educator, this study is practical as it proposes a measure of prevention and cure of a situation that if not handled with care may handicap the elderly and cause them to become a burden to their family and society. Quality feeding therefore becomes a professional tool that may ease symptoms, prevents certain disease or disabilities, reinforces the immune system, acts towards the elderly's special needs. Hence, reducing the degree at which they are sent to homes or care facilities. Seeing as the elderly are identified as a potential population for the delivery of special education services with attention focused on those who have functioned adequately for the most of their lives, but have acquired social and even mental disability as a result of the ageing process and mandatory trtirement. So the specialized educator may use this as a comprehensive educational program for the exceptional elderly that is based on special education principles. Applying it to certain crucial life adjustment areas of the lives of the aged such as daily activities and routines, home management, health care, interpersonal intimacy, new roles and status (Lampner, 2006)

This study's purpose was to grasp how dietary quality of life maintains cognitive flexibility in third age persons in view of preserving or limiting declines in their autonomy and independence. In several older people, mental health declines among which declines in mental flexibility does not only affect autonomy but also deprives older adults of their independence as the adults that they are. It goes ahead to have several serious implications for their overall personal wellbeing, reduces their contributions towards their families, and the society in which they live. There is currently better understanding of the interactions between nutrition and ageing which are essentially unravelling the mechanisms responsible for its positive or negative aftermaths, and to identify diet components promoting quality of life in the old age, and contributing to the prevention of late-life disabilities such as that which is the focus of this study.

Scientific research into the complex interactions between nutrition and health as part of the ageing process is of great significance in light of the current worldwide growth of the elderly population. Offering challenging opportunities to develop evidence-based strategies to enhance healthy ageing through feeding, with emphasis on preventing or minimizing mental impairment, and improving the overall quality of life in late adulthood. Reports Shabir (2020). As such, helping individuals improve or maintain their executive function in the face of advancing age is thus an important area of research. Targeted treatments for brain ageing will require an in-depth understanding of the mechanisms linking ageing to a functional decline in executive abilities, but importantly, some of the risk factors underpinning flexibility ageing are modifiable and may be amenable to intervention through feeding quality of life.

As a result the main question we asked ourselves was:

"How does dietary quality of life maintain cognitive flexibility in third age persons in view of maintaining (or reducing declines) in their autonomy and independence with increase in age?" to which we hypothetically gave as main answer:

*"*Interventions on lifestyle through diet can maintain or delay the decline of cognitive flexibility in third age person in view of preserving (or reducing declines) in their autonomy and independence with increase in age", (general research hypothesis). Three other hypothesis followed, which were:

SRH 1: Reciprocal interactions maintains cognitive flexibility in third age people in view of maintaining their autonomy and independence.

SRH 2: Person maintains cognitive flexibility in third age persons towards maintaining their autonomy and independence with increase in age.

SRH 3: Time maintains cognitive flexibility in third age persons with aim of maintaining autonomy and independence,

In order to tackle this hypothesis, the researcher conducted a semi-directive interview towards a small number of participants, four in number. The results obtained and analyzed through the use of the thematic content analysis technique allowed us to identify the various salient facts.

Firstly, older adults' autonomy and independence can be maintained with the maintenance of cognitive flexibility through quality dietary intake or quality food intake. This is made easy through reciprocal interactions (process), wherein exchanges with persons in the surroundings or immediate environment has shown to be accountable for more knowledge on what is "quality": quality of life, quality feeding, food quality and nutrients-rich foods. Therefore, process leads to cognitive flexibility in third age persons. For the act of interacting with others in itself is a characteristic of mental flexibility. Other than that, a person desiring to keep his flexibility with advance in age cannot do that if he has no idea how to go about it. Hence, highlighting the role of process in the cognitive flexibility of third age persons. Significant others, such as persons met around the environment, like doctor, specialists, and other significant others such as role models, have the potential of boosting eating habits. The results being successful ageing. Even though this same reciprocal interaction can also lead to less awareness or wrong awareness. To interviewees, reciprocal interactions or process, has worked positively for them and they are currently enjoying the "sharpness" it comes with.

Secondly, cognitive flexibility in third age persons is boosted by the "person" factor. Personal dispositions and resources characteristics are primordial for any initiative's beginning and success. Once there have been reciprocal interaction, the next thing that follows towards an application of the learned fact is the person's own motivation to go forth to living the quality life through a quality diet. As such, just interacting with persons and objects in the environment is not enough until action is taken. And this action is determined by individual's readymade desires or dispositions towards the act of quality feeding on the one hand, comprising both mental and

physical dispositions; and the resources needed for its accomplishment – experiences, financial, self-efficacy, physical resources and so on.

In the various participants, it was their personal determinations that pushed them to set up a regiment for themselves and even their family, for those married with children. It was their dispositions that made a difference in them, such that they could begin and stay consistent with their feeding quality of life. In other words, their intolerance to procrastination explains their up-to-date mental results. To most of them resources/disposition does not equate finances, with the little one gets, he can fix himself to consume nutrient-rich item over none or very less nutritious food items. Through their discourses, it comes out clear that nutritious foods are not just those foods from the Western world with name that are unpronounceable. Our culturally known food items are very rich too.

Thirdly, in participants, there is more chance to obtaining nutritious quality of life's benefits overtime. Consistency or an early start is key. As such, interacting and being disposed to start a quality feeding lifestyle is fine, but needs to be supported with consistency. Interactions maintained overtime produces more effective updates, especially with the current non-stop researches done on nutrition for the ageing brain. How healthy one eats towards days, months, years increases the chances of seeing great lasting results.

This study allow us to understand that nutrition is a powerful means that can be used strategically in either maintaining cognitive flexibility and/or reducing its decline in persons with advanced ages, by so doing, keeping these older adult autonomous and independent. It equally lays emphasis over the fact that for better results, quality of life feeding is best to be practice early in life to assure the future. Nevertheless, it is never late to begin feeding right, and for effectiveness over time and generations, the initiation of younger ones to eating healthy is recommended. A parent said:

> The problem with you youths is that you take everything. "Banga" and many other substances, you drink too much alcohol, and smoke in your youths. I would sometimes wake up early to take a walk around the quarter, it is my own way of exercising, and I

> see young children in terrible conditions, they are messed up, with red eyes, some are unconscious, wasting. Most of them will not see the consequences of this lifestyle now. That is why they think they are strong, but when age hits, that's when they will know.

Participants emphasize the importance of healthy eating practices and this can be achieved following Bronfenbrenner's model, moving from process, to investing in person, to maintaining the eating practice over longer period of time for long-term effectiveness. Like him, bandura believes that personal factors, the behavior itself and the environment are key aspects capable of pushing the individual to a eating successful routine. On his part, Ajzen explains that the act of eating healthy is derived from 'intentions', depending on the person's attitude towards the behavior at hand, and crowned by the individual's own perception of the degree of accomplishment of that behavior. As such, when the individual's attitude towards maintaining a healthy eating quality lifestyle is favorable, and that he perceives that people who are important to him want him to perform that type of a lifestyle, and, in addition he feels capable of performing the behavior, he will have a higher intention to adopt the behavior.

In the mental handicap aspect, it is important to mark that a person can be in a situation of handicap (aged), but not handicapped (is mentally flexible). Such that whether a third aged person is in a state of disability or handicap or not, his keeping a quality feeding standard or lifestyle will play the same role in maintaining his executive functions, his mental flexibility. Allowing persons in that state to be capable of exercising a certain amount of control over their environment or surroundings such that he owns a personal capacity organizing his own existence. As Dessertine explained, "handicap is a relative notion", it covers an evolutive situation. One can modify his level by ameliorating his aptitudes and capacity or by modifying his environment. Hence, maintaining a healthy eating habit can be of some assistance to people of this category as well.

At the methodological aspect level, the use of few participants (four) makes results to be difficult to generalize. Actually, this study's aim was to understand how quality dietary intake could maintain cognitive flexibility such that older adults of the third age range would still be autonomous and independent even though advanced in age. Hence, the study made use of case studies to understand that. The overall information gathered on the topic towards the participants

in this study and in the context where the research was carried out cannot account for other older adults' state of mental flexibility health. And as such cannot be generalized with assurance.

At the theoretical level, the results were interpreted in with consideration of the theoretical framework, even though our personal subjectivity was not kept aside. Considering this, these results may certainly not be free of bias.

The results obtained from the analysis of the participants discourse revealed that gender, marital status, and literacy are factors that had contributed to maintenance of mental flexibility through to feeding quality of life. The female gender were more conscious and willing to apply the practice of health eating in view of maintaining mental health and flexibility in ageing. Also, married people in general paid much attention on what they ingest, in view of maintaining overall health for themselves and family. And the literate opposed to the illiterate had little understanding in regards to the potential feeding has over cognitive and executive functionality capacities in both the young and the old.

From all the aspects or themes used to apprehend flexibility maintenance in this study, we highlight that, process appears as the variable that has more weight. It is through exchanges or interactions with the environment – persons and objects and even symbol that individuals get information on what is needed to age properly and maintain their functional capacities with the passage of age. For knowledge is power, while ignorance leads to errors that are sometimes irreparable.

This study was carried out on participants who are either retire or not, who had each to an extent strictly followed a quality eating style such that they can now enjoy in their advanced age their parental duties and others thanks to their maintained executive functionality. However, it will benefit this study that more in-depth qualitative and even quantitative studies be carried out on this topic for the benefit of not just the aged in our communities, but for the ageing young as well.

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ANNEXES

REPUBLIQUE DU CAMEROUN
Paix – Travail – Patrie
*****
UNIVERSITE DE YAOUNDE I
*****
FACULTE DES SCIENCES DE L'EDUCATION
*****
DEPARTEMENT D'EDUCATION SPECIALISEE

REPUBLIC OF CAMEROON
Peace – Work – Fatherland
*****
THE UNIVERSITY OF YAOUNDE I
*****
THE FACULTY OF EDUCATION
*****
DEPARTMENT OF SPECIALIZED EDUCATION

The Dean

N° 366 /22/UYI/FSE/VDSSE

RESEARCH AUTHORISATION

I the undersigned, **Professor BELA Cyrille Bienvenu,** Dean of the Faculty of Education, University of Yaoundé I, hereby certify that **TIKUM Hortense ANYAH,** Matricule **20V3051,** is a student in Masters II in the Faculty of Education, Department: ***SPECIALIZED EDUCATION,*** Option: ***MENTAL HANDICAP.***

The concerned is carrying out a research work in view of preparing a Master's Degree, under the supervision of **Pr. MGBWA Vandelin.** Her work is titled ***« Quality of life through feeding and cognitive flexibility of third age persons ».***

I would be grateful if you provide her with every information that can be helpful in the realization of her research work.

This Authorization is to serve the concerned for whatever purpose it is intented for.

Done in Yaounde, the 18 MAI 2022

For the Dean, by order

Le Vice-Doyen

PARTICIPANT INFORMED CONSENT FORM

I, the undersigned, Mr/Mrs.....

Have voluntarily agreed to participate in this research study by TIKUM HORTENSE ANYAH, Master II student from the University of Yaounde I, Department of Specialized Education, whose research topic is: "Quality of life through feeding and cognitive flexibility of third age persons", directed by Professor MGBWA Vandelin of the University of Yaounde I.

The main purpose of this study is to understand how individual's feeding lifestyles account for their cognitive flexibility maintenance in advance age. The conditions for participation are to be a person of the third age range (65-79 years old), healthy enough to carry out the research etc. This study does not imply any risk, however, some questions could cause some discomfort. Participation in this study is voluntary and unpaid. You have the right not to participate or to stop your participation at any time, without any justification. The data collected will be treated anonymously and confidentially for educational purposes only. If you would like more information about the study, please feel free to contact us by phone at (+237) 654487608.

- I have understood the purpose of this study and have had the opportunity to ask questions about the study;
- I agree to my interview being audio-recorded and I understand that in any report on the results of this research my identity will remain anonymous;
- I understand that even if I agree to participate now, I can withdraw at any time or refuse to answer any question without any consequences of any kind;
- I understand that a transcript of my interview in which all identifying information has been removed will be retained for a relevant period time.

I freely agree to participate in this study under the conditions specified.

Signature of research participant ---------- Date ----------

Signature of researcher (I believe the participant is giving informed consent to participate in this study) ---------- Date ----------

THEMATIC INTERVIEW GUIDE

THEME 1: Process (Reciprocal Interactions)

Q: Can you tell me about nutrition/feeding? How important can it be in maintaining health in people as they grow?

Subtheme 1: Interactions with people

Subtheme 2: Interaction with objects

THEME 2: Person

Q: How do you react to the new ideas you get on the topic?

Subtheme 1: Dispositions (His/her quality of mind and character)

Subtheme 2: Resources characteristics (bioecological)

THEME 3: Time

Q: How often and for how long have you been practicing the feeding habit?

Subtheme 1: Microtime

Subtheme 2: Mesotime

CONTENT OF INTERVIEWS

Participant 1: Case R. (68 years)

Researcher: Can you tell me about nutrition/feeding? How important can it be in maintaining the individual as they age.

Case R: Nutrition to me are mostly leaves, they contain lots of vitamins. Meat too is good. I was born in vegetables and bush meat. I also do not eat much oil. Do not eat too much oil especially when you are beginning to become old. Moderate on it. If you are consistent with this regiment, you are sure to have no complications whatsoever with health, even in child birth for women. And you will remain apt even in old age. Drink water well also. For me, it was only around age 50 that I started drinking alcohol, with moderation of course. Moderation is important. I drink palm wine and a drink called in our place "L'ail". I manufacture it myself through fermentation and cooking. And I used to take this in the place of beer.

Researcher: Do you still practice these now?

Case R: Yes. As I said, I grew up in the village where we mostly grow green leaves among other foods. So where I lived also influenced my eating habit, such that even now I stick with eating such.

Researcher: You mentioned your surroundings influencing what you eat, can you tell me more?.

Case R: Almost everywhere in the village you'll find green leaves. That is what I meant. You eat them because that is what is available and that is what everyone else eats, and you can see that everyone is healthy, even the old, so you maintain the feeding style.

Although I had been eating that, I came to know the value and riches of this food when my brother who was the medical doctors for the indomitable lions told us to keep it up. He said eat green leaves of all sorts and cut down on oil. I actually learned about reducing oil consumption through him. It was him who told us to cut down on oil. And since then, I have practiced that from, since before I got married and started giving birth.

I gave birth to 11 children, I delivered 2 by myself all alone, with no complications. The secret is in maintaining the body, you need to eat well, that's how efficient nutrients are. Even now, I can tell you that I have never had any serious disease. Everything about me is still well because I eat well too.

The problem with you youths is that you take everything. Banga and many other substances, you drink too much alcohol, and smoke in your youths. I would sometimes wake up early to take a walk around the quarter, it is my own way of exercising, and I see young children in terrible conditions, they are messed up, with red eyes, some are unconscious, wasting. Most of them will not see the consequences of this lifestyle now. That is why they think they are strong, but when age hits, that's when they will know.

Researcher: Did **y**ou say it was your exchanges with your brother that helped you gain insight on food quality and its benefits?

Case R: My brother taught me a lot, each time he visited, we would discuss on the topic. My husband taught me some things also, he was very apt man, a hunter, he came with his own eating habit and I adopted it too. I learned a lot with my interactions with these two men. Now I am the one influencing my people around me, many people in the village come to me for advice on various topics: foods, medicine, and childbirth. When I come and stay for this long in Yaounde, they begin to complain.

Researcher: During the conversations with your brother, the doctor, what were your reactions to the new things he told you?

Case R: I took the advice. I like good things. When it comes to keeping fit I am in. Also when you are conscious of the risks and benefits for a thing, your reactions revolve around it. Who likes to fall sick? So you do what is necessary to avoid it. When you know what you would gain, and when you know what you may lose, it is left for you to decide. I schooled in Douala from form 1 to form 4. I would rent a house for 9 months and use my monthly allowance to feed myself and handle my needs. I would eat healthy even with little money because I already knew what healthy was, thanks to my brother.

Researcher: How about here in Yaounde, how do you manage everything?

Case R: Here I live with my daughter, and her husband. They have their own preferences, I do not have rights over what they chose as menu. However, my daughter who knows of my preferences, sometimes surprises me with those. But I cannot force them to follow a particular diet. We communicate together, but the decision is theirs. Sometimes they cook vegetables as I like, sometimes they do not. I cannot change that, but I can do my own part to keep active. In the village what I often do is I wake up early, I go to the stream and pour some cold water on my body, I then dress warm and go to the farm. Farm-work is my own type of sports. Here, because there is no farm, I wake up early pour some water on my body and go for a walk. I also like cooking. It is another exercise for me. In the village we use stones to cook, here is modern and easier: you grind in the house, you bake things. All is much easier.

Researcher: You mean modern utensils eases work for you?

Case R: (Laughs). When I don't know how to use it, they show me, and I learn. Some of these tools make life easier, and practical, you don't feel lazy to do something for yourself because half of the work will not require your energy (like breaking firewood. We use use gas-cookers instead, although not all the time, sometimes it is stove and kerosene too. For food that stay too long on the fire, or need a lot of heat, like "coki-corn", we light up 3 stones fireside like in the village. When I am in town I use available utensils, when I am in the village, I use what is there.

Researcher: Is there something else you would like to add…

Case R: Yes, youths need to respect their youth, avoid all these medications, substances, drugs, use that money to eat better. Be humbled and disposed to learn. These things that I am telling you, many young people don't know about it, the white-man is succeeding to erase our culture and our feeding habits. Now young girls just want sweet things: chocolates, yogurts, biscuits… You don't need to commit errors and then learn from them, you can learn from experienced people or errors of others. When I meet some of my classmates from Douala, some of them look so frail... I am glad that you want to write on these things, let people know, that food is good in keeping people in shape, active, and apt and flexible as you call it. I can walk from here to the next quarter and but many people my age cannot. Also, marry a good man, love in our days was full of love, your husband would make sure you eat the best foods so that you would make him healthy babies. But these days, with these boys who smoke things, aka!.

Researcher: For how long should one practice feeding well?

Case R: From my young age, I started practicing eating well. Like I said before, many people in my surrounding were eating well, even the old in age did not seem old. My big brother had advised us, even though he is no longer practicing as a doctor now. He said eat green leaves of all sorts, reduce oil consumption. So I started that lifestyle since, when i had not yet given birth. And I am confirming its good deeds… I don't suffer from pains, Even now I am still in it because I see results. There is no time limits, be consistent with it, it costs you nothing or not too much, but you will gain everything.

Participant 2: Case E (66 years)

Researcher: Can you tell me about nutrition/feeding and its benefits to people as they grow?

Mme E: The importance of food is beyond words description. It has always been important to our family, my mother would always lay emphasis on the type of food we should go for even in school, or in schools' canteens. Now food is important to me too, I learned how to cook different types of dishes from my mother, she taught me everything, and when I have an opportunity to learn, I do. Food have unbeatable riches, they can prevent illnesses, cure them, maintains health, regulate the body, controls many things in a person, even the brain health etc. Knowledge of the right food to take is so important for the whole family: babies, toddlers, adolescent, adults, everyone. People do not know this, they think of food as that which should be eaten to prevent death alone.

Researcher: You said food is important to you now too, what did you mean by that?

Case E: what I mean is that my mother had always been careful about the type of food we eat, so much so that it became part of me. In my own marital home, I don't joke with food, I make sure the entire family consume essential food for their well-being and health. I interact a lot with fellow married women friends here and abroad and gain more knowledge on how to make the best dishes for my husband and kids, and also make sure that they learn for themselves. Eating well has become a law for us. We eat three times a day, even when there is not enough, we still chose quality over quantity. That's how I brought up my children.

Researcher: what type of foods do you take and how beneficial are they?

Case E: Nothing extraordinary, I make sure to incorporate vegetable and fruits in the menu. And we vary foods also, so that they are balanced. My favourites are greens, then the rest can follow. To benefits from all the nutrients in food and fruits yearlong, we follow the practice of eating according to seasons, it is easier for us that was. What I mean is, for example, when it is the plum reason like now, we eat plums, when it was the mango season, we ate those etc. That's how we make use of food and gain its richest nutrients each time. Till now, it has not failed me. If you want to know the precise nutrients in any particular phone, you can search for it using your phone. I do that sometimes too.

Researcher: What have you noticed nutrition has caused in you?

Case E: I can say I am healthy, and have practically been healthy my whole life, i am fresh too and sharp, I look younger than my age also, although I just turned 66, my friends say I still look 45. Food helps in many aspects, what I have also been doing is recreate foreign dishes. There is this channel on Tv that shows interesting foreign dishes that seemed delicious and easy to reproduce. I began attempting those at home a few years into my marriages. I like cooking and I like experimenting with new foods too.

Researcher: Apart from the above what else do you indulge in?

Case E: oh! I am a tea-drinker. Teas are rich too, many people don't know about it. I use tea every day and everywhere. Green tea

Researcher: What do you mean?

Case E: I don't think this information will be useful to your research, however, what I mean is I use it inside and outside. I drink the tea and apply some of it topically for beauty purposes. Teas have the ability of giving some sort of freshness to its drinkers. I like trying new trying new things.

Researcher: What can you say about people your age who are not as "sharp" as you?

Case E: these fingers are not the same, I don't know about their styles, their beliefs, their experiences, or their preferences. But I know that doing the right thing produces the right results. I personally am opened to learn, especially when it comes to health. Although I left school since, I know some foods are good for the brain and memory, so I invest on them for myself and the whole family. During exams periods, I made sure to eat some black chocolates, I ate fried corn

and ripe bananas. There's a lot to gain behind food, I guess concerning the old you talk about… food can keep them sharp too.

Researcher: For how long do you advice people to practice such eating behaviour

Case E: long-term practices is necessary, I have been eating good all my life and I don't see why I should stop now. Also, we all eat everyday, why not chose to eat good?

Participant 3: Case S (65 years)

Researcher, Can you tell me about the influence of feeding/nutrition on human beings well-being?

Case S: Failure to eat a balance diet leads to malnutrition. Good food doesn't mean you should have much money, with what you have you can obtain a healthy diet and all its outcomes. People should understand that good food is not all about meat, chicken… lets stop being ignorant and focusing on that alone. It is okay to ask around for advice as you are doing right now, to learn more on how you can get the best out of the food you eat.

Researcher: Does it mean that what you know is from what you asked around?

Case S: Me, I know all these things from my past experience. As a young girl I worked as a "service traiteur", due to this I was constantly in contact with all sorts of foods, menus, styles of preparation etc. For example, in an important party or ceremony, you'll see they cook "banane malaxee" and you may wonder why, but this food is a well-balanced diet. Rich in nutrients. It contains groundnuts, palm oil, dried fish or meat, with spices. Everything in a food such as that is very rich and good for health maintenance. When I saw such, I would ask questions at the end of the ceremony to understand why such in a ceremony like that one. They give various reasons but somewhere along the line they will mention its nutritious qualities. The answers they gave served as guidelines for me. And things are easy these days, at first, our parents would think twice about cooking certain foods like banane malaxee for example, because the groundnut would have to be ground on a grinding stone. And the food cooked were in very large quantities, in big pots for a large family including extended families. But nowadays, there are grinding machines everywhere, with 50 frs, your groundnuts can be ground. So, we have almost no excuses- life has been made easy for you, but the choices most of us make are poor.

Researcher: so in your opinion nutrition is important for the growing (ageing) person? How?

Case S: that is why I began by contrasting good food to malnutrition. If you eat, you will live because the food will keep you alive. If you eat an unbalanced diet like rice every day, you will still live but you will develop some deficiencies. Now imagine you eating quality food daily, well balanced and full of nutrients, minerals and vitamin… you see that you have the answer to your question now my daughter.

Anyways all of these begins from the mind, if someone does not believe that what he eats, makes him who he is, then no matter what you say, he will put no efforts into practicing a good eating behaviour. But I tell you that eating well is important for everybody, especially babies and the old. Those two categories of people need the best of food to grow well. Yes, the baby needs nutritious foods for his body, soul and intelligence development, while the old needs it to keep it. These sickness that you say old people have that make them forget things, why did our parents not have those? They fed well.

Researcher: If I understood you well, it is from your personal experiences, that you say feeding quality makes healthy?

Case S: I observe, I travel a lot, I went to school, I had part time jobs like the one I told you of. That's how I know what I know. However, I also learned a lot of things from being a housewife. Being a wife is like a school, when you are well loved, even your in laws will lick some secrets to bringing up a healthy home. For example, one of sister-in-law would visit each time I gave birth, and stay with me for over a week, and she would talk about these things whenever she had the chance. So I kept learning, i don't resist knowledge, even though sometimes it felt like she wanted to teach me how to handle my own house. But I embrace what is good, and pay no attention the rest. I also went by trials and errors, when something works well, I incorporate it. I have a note book in which I keep every key recipe, clearly stating its riches and benefits. My dream had been to open a special restaurant when I was younger.

Learn, even when it is a child that teaches you. My children often come home from holidays in the village, with recipe and nutritious ideas from older adults there, and when it makes sense to me, I make use of it.

Participant 4 : Case T (65 years)

Researcher: Can you tell me about your eating habit?

Case T: I eat what I am given, I don't impose or expect anything regarding what I want to eat for the day again. That was before, now that my wife is no more, and at this my age, my children who seem to know me well, provide me with the things they know I like and those they think is good for me. Sometimes I have the impression that my children cut down on salt in the food they cook for me. I demand for additional salt, but they say its taste just fine, so I am forced to force that down my throat. I also do not like anything too sweet, all these sweet things, juice or fruit juice… I prefer the fruit itself.

Researcher: what do you think of nutrition for overall health and brain health?

Case T: in my youth, I use to love nice things, I take girls to restaurants, we eat nice things. I like clean things, clean clothes, clean food, not vulgar things. My children who are presently taking care of me, know of my taste and try providing me with the necessary. Even though a man, I like the taste of African spices in my food. As a young man, I use to cook myself. For perfect cognitive health, there is none other than quality food enriched with African spices - spices of all sorts. Also try incorporating rare fruits. I am particularly interested in those fruits from the north, I don't know most of their names but I purchase most of them whenever I see them. There are dates, for example.

Researcher: You mentioned purchasing things by yourself, what do you desire obtaining from those?

Case T: I buy them when I see them, actually I buy those things because they are rich in nutrients, and they are rare to find. So when I have the chance to buy, I buy. Although sometimes I see them when I don't have enough cash on me. So yes, resources matter too, money. But having the desire is a plus already.

Researcher: What particularly do you hope to get from purchasing those?

Case T: I also look forward to maintaining the right shape, avoiding overweight, and big belly. As a youth I was somewhat fat, I started working on my shape very young, when I was about 18 years old. I had cut down on alcohol, so that I don't develop big belly. By 25 I was cute. The outcome

is great, and you are not the first to ask. Many people especially young ladies like you ask me a lot on how I handle myself to be as I am now.

As I said, I started following diets for a good shape, but the benefits are way broad than this.

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