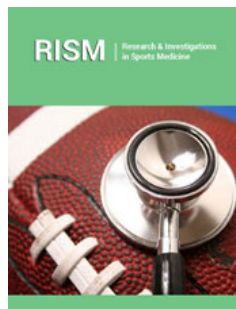


The Aging Process in Riverside Communities

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Abstract

Human aging is based on factors associated with lifestyle, socioeconomic conditions, and the absence of functional limitations. This study sought to evaluate the aging process of the riverside population, the social determinants of health, autonomy, functional independence, and quality of life. Being a cross-sectional field study, carried out from December 2019 to January 2021, on 6 river islands in the municipality of Abaetetuba, sixty-six riverside elderly participants in the study, responded to a form developed by the authors, to the World Health Organization Quality of Life questionnaire and the Clinical-Functional Vulnerability Index. Qualitative data were analyzed using the Wordle application and the quantitative data were analyzed using Pearson's Correlation and Spearman's Correlation tests. For 75.8%, aging was considered excellent, very good, and good and, the perception of aging was related to "tranquility; be healthy; reach old age well; get old". The riverside elderly considers the process of their aging to be positive.

Keywords: Aging; Aged; Social determinants of health; Quality of life

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Introduction

Human aging is an irreversible, progressive and universal process, but the way this process will occur is associated with lifestyle, socioeconomic conditions, and the presence or absence of functional limitations. Therefore, autonomy, functional independence and the Social Determinants of Health (SDH) have a direct influence on this process [1]. Autonomy is described as the individual's capacity to make decisions. On the other hand, functional independence refers to the ability to perform activities without the help of others and is directly related to mobility and communication. As for the SIH, they are described as a set of individual and collective conditions that go through biopsychosocial issues [1,2]. For a broader analysis of this context, it is necessary to make correlations between health status and social issues, which can be analyzed through the model that was proposed by Dahlgren and Whitehead, where the SIH are approached in sequential layers, revealing the degree of interaction with the individual. The first layer refers to individual characteristics, which are: age, sex, hereditary issues and lifestyle. The second layer refers to the relationship between the organization and the individual's level of social cohesion. The next layer presents the factors related to the individual's living and working conditions, such as the environment and working hours, education, housing, sanitation conditions and access to health services. And finally, the last layer makes a relationship between the economic, social and environmental conditions that the individual is exposed to in society [3].

This new perspective is the result of historical changes that have provided subsidies for the aging and the relationship between health/disease to be analyzed within broader aspects, thus being possible to highlight differences existing within each population, aiming at representing the local identity. Riverside populations in the Amazon represent a mixture of social groups, whose characteristics differentiate them from the urban population. They live

in rural areas, on the banks of rivers and their daily lives are lived under the influence of the dynamics of the waters. Their economy is based on fishing and vegetal extraction activities, with the heritage of traditional peoples. They have their own habits, use medicinal plants and do subsistence agriculture. They lack basic sanitation, electricity and health services. Access to the urban area is usually limited by distance and transportation is only by river. Therefore, the choice of the target audience for this study was based on representing the diversity of the population of the Amazon region, especially the riverside dwellers [4,5].

The city of Abaetetuba was chosen both for its proximity to the riverside community and for the fact that the researchers involved have a close knowledge of the local reality, verifying that the riverside dwellers have a particular way of life linked to a whole life journey passed from generation to generation, thus it is necessary to have a different look at the aging of these individuals, thus it is essential that this population has visibility, and that their aging is described in order to represent coherently the way they experience this process [6]. The city of Abaetetuba belongs to the mesoregion of northeast of Pará, occupies an area of 1,610.74 km², has an estimated population of 160,439 people in 2021 and an HDI of 0.628. It has 72 islands located at the confluence of the Pará and Tocantins rivers, in addition to 16 locations located around the roads. The distance between the cities of Belém and Abaetetuba is 121km by land and 91km by river. It is an important commercial and industrial center. The activities that most drive the economy in the municipality are aluminum metallurgy and its alloys, agriculture, fishing and commerce. In recent years Abaetetuba and its rivers have been experiencing impacts due to environmental degradation, mainly by the toxic residues of aluminum extraction and processing,

reaching riverside communities since they survive from artisanal fishing. In this sense, the aim of the present study was to evaluate the aging process, autonomy, SIH, functional independence and Quality of Life (QoL) of the riverside population of Abaetetuba. Due to the scarcity of studies that describe the relationship between these variables, the researchers wish to present to the scientific community in a particular way the way of life and the aging process of the riverside communities in the municipality of Abaetetuba.

Methods

This was a field study, exploratory, of cross-sectional type, descriptive, of qualitative and quantitative approach. The entire research trajectory was carried out in the period between the months of December 2019 to January 2021 in 5 river islands in the municipality of Abaetetuba, being: Sirituba, Tabatinga, Guajarazinho, Campopema, Urubuéua and the village Vilarejo of Beja, in the State of Pará (Figure 1). The study was approved by the Municipal Health Secretary of Abaetetuba and by the Committee for Ethics in Research on Human Beings of the University of Pará State (CEP/UEPA) under CAAE n. 15031319.5.0000.5174 and was approved by opinion n. 3,557,176. To calculate the sample size the following formula was used: The margin of error of 10%, the confidence level of 90% and the heterogeneous distribution (50/50) were considered. The population of elderly residents in rural areas of the municipality of Abaetetuba is classified according to the census of IBGE (2010), as individuals living in the rural area [7]. This group is composed of 58,102 people, including men and women who reside in the 72 islands of Abaetetuba, in 16 communities around the roads, in the 40 branches, and in the district of the municipality of Abaetetuba (Beja).



Figure 1: Map of the Municipality of Abaetetuba, the 5 islands and the village Vilarejo of Beja. (1) Tabatinga Island; (2) Sirituba Island; (3) Campopema Island; (4) Urubuéua Island; (5) Guajarazinho Island; (6) Vilarejo de Beja Village, Red line: Boundaries of the municipality of Abaetetuba

In this way, the number of the population of the six islands was given by a calculation in which the total number of the elderly population residing in the rural area (58,102) was considered as the dividend, and as the divisor, the sum of the number of rural

communities of Abaetetuba (129). Thus, the quotient of this operation was multiplied by six, since there were six locations surveyed, obtaining the quantitative of 2,702 people, arriving at the sample size after applying the formula of 67 elderly people.

To compose the sample, we considered as inclusion criteria the elderly people from the riverside who took the Mini-Mental State Examination (MMSE) and reached a minimum score of 15 points for illiterate people, 18 for low and medium education and 26 for high education [8,9]. Elderly people who scored lower than expected on the MMSE were excluded from the study (Figure 2). In the data collection stage, the participants were characterized using a form created by the authors containing several variables based on the Social Determinants of Health (SDH). In the present study, the following SDH were considered: gender, age, marital status, occupation, smoking, alcoholism, Diabetes, Hypertension, Hypercholesterolemia, education, income and access to health services, making up the layers proposed by Dahlgren and Whitehead [3]. In addition, two open-ended questions were included to guide the discussion on the aging of the riverside dweller, which was:

- "What is aging for you?"
- "Is aging good or bad, why?"

$$n = \frac{d^2 \cdot p \cdot q \cdot U}{e^2(U - 1) + d^2 \cdot p \cdot q}$$

Figure 2: Formula for calculating sample size.

n = sample size, d = standard deviation, p = percent success, q = percent failure, U = population, e = margin of error

Following this, the validated World Health Organization Quality of Life (WHOQOL-Old) and the Index of Clinical-Functional Vulnerability (IVCF-20) instruments were applied. The WHOQOL-OLD analyzes the Quality of Life (QL) of the elderly according to six domains or facets, which assess sensory functioning; autonomy; past, present and future activities; social participation; death and intimacy. The IVCF-20, on the other hand, has a multidimensional character and can assess functional independence and autonomy, as it is composed of 20 questions that address the main markers of clinical and functional frailty in the elderly [10]. The final stage of this study was focused on data analysis. To perform the qualitative data analysis, we used the IRAMUTEQ software (Interface de R pour les Analyses Multidimensionnelles de Textes et de Questionnaires). This software allows different processing and statistical analysis of produced texts: classical textual statistics; group specificity search; hierarchical descending classification; similarity analysis and word cloud. In the present study, the word cloud was used for data processing.

Word clouds are images usually presented as illustrations to superficial common-sense reading. The size of each word indicates its frequency, accepted as a proxy for the relevance of a given theme (SURVEYGIZMO) [11]. The quantitative results were data cataloged and organized in an electronic spreadsheet and analyzed using average and percentage. To check for adherence to the normality curve, the Shapiro Wilks [12] test was used. To quantify the SDH, one point was considered for each positive variable and zero for negative ones; thus, if the participant did not smoke, did not drink, did not have diabetes, hypertension, cholesterol, was literate, had income, had no pain, and had access to health services, he/she would get the maximum score of nine points. For the statistical analysis of the correlation of the results between the variables: QL/functional independence; and SDH/functional independence, Pearson's Correlation test was used. To correlate the SDH/QL the Spearman correlation was used, being considered as a classification of the value of Pearson's r and Spearman's P: 0.10 to 0.30 (weak); 0.40 to 0.6 (moderate); 0.70 to 1 (strong). The value of statistical significance was $p < 0.05$. The variable age was analyzed in three ranges and the p-value was determined by the Chi-square for equal expected proportions [12].

Result

Sixty-six elderly people, aged 60 years or older, participated in the study and signed the free and informed consent form. From the total sample (66 elderly), three questionnaires were excluded for scoring below the cutoff point in the MMSE, leaving the final sample composed of 63 participants. There was similar participation between genders, 79.36% said they were married, 47.62% said they were illiterate, 68% said they had access to health services, and other results related to the sociodemographic profile are described in Table 1. The perception of the elderly in relation to old age is exposed in the word cloud (Figure 3), in which it is evident that the most expressed terms were: "tranquility; having health; reaching old age well; getting old". It was also said, "family raised; need help; rest; illness". Regarding the second question "Is aging good or bad, why?", it was verified that 47 (75.8%) people described that aging is Great, Very good or good, and 15 (24.2%) of the participants presented negative answers regarding their aging process, and the reasons for finding it good or bad are expressed in Figure 4, where we can see that "quiet life, live in the good place and create the family" were the terms most used to designate why it is good to grow old, while "illness, pains, dependence on someone else and fear of pirates" are factors that make the elderly consider it bad to grow old.

Table 1: Sociodemographic profile and health indicators of the riverside elderly participants in the study.

Variables	Categories	No	Percent (%)	p-Value
Sex	Male	35	55.55	-
	Female	28	44.44	-
Age group	60-67	47	74.6	0.9972*
	68-76	11	17.46	
	77-85	5	7.94	

Marital Status	Not married	2	3.17	-
	Married	50	79.36	-
	Separate	3	4.76	-
	Widower	8	12.7	-
Occupation	Craftsmanship	5	7.94	-
	Animal husbandry	5	7.94	-
	From home	16	25.4	-
	Fishing	11	17.46	-
	Açaí plantation	9	14.29	-
	Farm	11	17.46	-
	General Services	2	3.17	-
	No activities	5	7.94	-
	No information	3	4.76	-
Education	Illiterate	30	47.62	-
	Incomplete Elementary School	30	47.62	-
	Technical education	1	1.58	-
	University education	2	3.17	-
Access to Health Services	Yes	43	68.25	-
	No	20	31.74	-
Quality of Health Services	Bad	22	34.92	-
	Regular	20	31.74	-
	Well	21	33,330	-
	Very good	0	0	-
Illnesses	Hypercholesterolemia	25	39.68	-
	Diabetes mellitus	14	22.22	-
	Arterial hypertension	31	49.2	-
Medication Use	Yes	40	63.49	-
	No	23	36.5	-
Amount of Medicine	None	23	36.5	-
	01-Feb	25	39.68	-
	>/3	15	23.81	-
Life Habits	Alcoholism	30	47.62	-
	Smoking	18	28.57	-
	Leisure Activity	63	100	-



Figure 3: Word cloud regarding the perception of the elderly in relation to their aging process
Source: Research Data.



Figure 4: Word cloud of reasons why they think it is good or bad to get old.

Table 2, in turn, presents the WHOQOL-Old results by facet where we can see that in relation to the quality of life, the overall mean score of all participants in this research and the sum of the means of all facets was 101.02 (SD=7.63) representing a good quality of life. Regarding the data obtained in the ICFV-20 questionnaire for the identification of biological frailty, of the 63 elderly participants 44 (69.84%) were classified as Potentially frail elderly (7-14 scores), 18 (28.57%) as Robust older adults (0-6 scores) and 1 (1.58%) as Fragile elderly (≥ 15 scores). There was no correlation between the variables Quality of Life and Functional Independence (Person's correlation: $r=0.0604$) and between Social Determinants and Quality of Life (Spearman's correlation: $\rho=0.1772$). The correlation between Social Determinants and Functional Independence (Person's correlation) showed a moderate correlation with an r value = -0.4888 ($p<0.0001$).

Table 2: WHOQOL-old instrument score of study participants.

Facets	Average	Facet Average
Sensory Functioning	18.29 \pm 1.90	4.6
Autonomy	15.37 \pm 2.47	3.8
Past, Present and Future Activities	16.78 \pm 2.32	4.2
Social Participation	17.17 \pm 2.08	4.3
Death and dying	15.89 \pm 2.31	4
Intimacy	17.52 \pm 1.99	4.4
Total Score	101.02 \pm 7.63	4.2

Discussion

Regarding the characterization of the participants of this research, the socio-demographic reality of the islands of Abaetetuba shows that most of the elderly have low education and low socioeconomic level, which reflects in the social dynamics of most participants. The educational difficulty is caused by the inadequate structure of the schools, difficulty in river transport, insufficient professionals and precarious working conditions, which end up affecting the quality of education, causing low schooling. Besides the difficulties related to transportation, the need to develop an activity that guarantees family subsistence has become much more important than studies [13,14]. In riverside communities, their source of income is basically tied to artisanal fishing, the cultivation of small plantations and the support of social security benefits. It is worth mentioning that many elderly people can be supported by social security benefits, but the amount received is not enough to meet their demands, and it is necessary for the elderly to remain active in work activities to achieve family support [14]. The socioeconomic situation of the riverside population plays a key role in determining health since low education can affect the way in which health is conducted. Santos et al. [15] in their study, states that a high level of education is related to better health conditions, and a higher life expectancy. Such conclusions are linked to the type and quality of access to information, i.e., people with more education adopt lower risk behaviors for health, with good eating habits, more access to health services, and a lower proportion of

inappropriate lifestyle habits, such as sedentarism, smoking and alcoholism [14].

During the questioning about their occupations, most of them reported that they developed or develop the practice of fishing and/or açai cultivation as a form of family livelihood, even reporting that these activities were learned and followed as a family inheritance. The way of life and the work relations of the riverside dwellers are linked to nature, as well as the skills and experiences acquired throughout life. Thus, parental bonds make the family and its relations an important theme to be shared socially, as it characterizes and describes the construction and affirmation of their socioeconomic relations [15]. Nascimento; Cardoso; Pinto et al. [16], state that amid the physical changes of aging and the arrival of retirement, this would not mean the need to completely abandon their work routine or stay with idle time, on the contrary, the social construction of these riverside dwellers ties to work, their occupation goes beyond the economic factor; but pervade social issues [16].

Thus, by presenting effective participation in the social environment, age itself and the functional limitations of aging would not be an impediment for the elderly to continue developing their activities, staying active and presenting a good perception of quality of life. Although it is described in the literature that total functional independence is considered one of the fundamental factors for a good quality of life, in this study it was verified that the perception of quality of life has much more subjective aspects [16]. Silva et al. [17] discussed the influence of the educational level on health conditions. In this study, it was possible to verify that the educational level of the interviewees was low and may be contributing to health conditions. The perception of the riverside dwellers about their quality of life may have been influenced by the access and quality of health services since when asked about the quality of health care, most responses were described as regular or poor due to difficulties in access to health services, the lack of health professionals, the absence of inputs for basic care such as continuous use medicines, materials for dressings and vaccines, and the difficulty of travel to health services in downtown Abaetetuba [17].

It is known that environmental and socioeconomic factors must be considered when studying the health/disease process of a population [18]. In the case of river dwellers, the difficulty in accessing health resources and services confers vulnerability, since they become more susceptible to morbidity and mortality processes since it is possible to regularly monitor some chronic diseases such as systemic arterial hypertension through health units. Among the participants, it was noted that most of them had hypercholesterolemia, diabetes mellitus, and systemic hypertension [19,20]. Regarding the issues of illness and the use of medicines, the pharmaceutical industry mentions the importance of the use of drugs as a preventive or curative measure for certain diseases, especially those related to Noncommunicable Chronic Diseases (NCDs). But when used in the modality of self-medication, there are several harmful effects generated on the human organism. Moreover, the use in large quantities can cause polypharmacy, which

is the use of 5 or more drugs daily. In individuals over 65 years of age, this practice has become quite common as morbidities set in and there is a lack of proper medical guidance, so it is necessary to follow up and monitor chronic diseases to minimize the excessive use of these drugs [21]. In the present study, the elderly showed low use of medication; most of them used up to three pills a day, which would not constitute cases of polypharmacy. A factor associated with the low use of medication is linked to the local culture, where the use of empirical practices derived from popular wisdom plays an important role in the healing process, where resorting to these practices is a way to solve their ills as safely as possible. It is worth noting that other studies have observed the association between empirical practices and self-medication among river dwellers, justified by the logistical problems of the location, such as the absence of local medical care, the travel time from the community to the urban area, and longer waiting time for care in health services in other locations [22].

As for lifestyle habits, it was found that approximately half of the survey participants consumed alcoholic beverages; the frequency of consumption was not reported, but most of them answered that this consumption occurred mainly during family meetings and/or with close friends. As for smoking, few reported effective practices. However, even if in small amounts, both are considered risk factors for NCDs [23]. Regarding the leisure activities developed by the research participants, almost all of them reported having some kind of activity; it is worth mentioning that during data collection these activities were described with much enthusiasm. According to Cerqueira [24], leisure, besides causing a feeling of well-being, also contributes to improving the physiological functioning of the body, which contributes to the prevention of certain diseases. Thus, the importance of leisure activities in the lives of the elderly can be noticed because the favorable aspects of aging and quality of life are not only linked to physical factors but also go through subjective aspects, favoring the feeling of satisfaction and fulfillment [25].

Thus, all the DSS described above directly influence the aging process in riverside communities, being important when it comes to understanding what is the relationship between environmental, social, and cultural issues on aging in this location. In this research, it was found that the elderly river dweller is immersed in an environment that emanates tranquility, and plenitude, without rigid routine patterns, a less hectic pace of life, and still holds an important role in community decisions. This gives the elderly a positive view of aging, creating their social representations [25]. This was perceived during the answers to the open-ended questions, which were presented in the word cloud. Thus, for successful aging, it is expected that the individual presents a good quality of life, and as a way to evaluate this variable, the WHOQOL-Old instrument was used to check if the elderly would present good scores, showing how satisfied they are with their health condition, well-being, social participation and interaction, good cognition, and activity levels [26]. Thus, this study verified a positive view on the quality of life of elderly residents of riverside communities, which is justified by the fact that the aging process is experienced under a broad perspective, which involves the local tranquility, the

performance of representative roles, and social participation, the vast experience, and personal achievements [27].

However, for a more comprehensive view of the quality of life, studies describe that the WHOQOL-Old instrument must be used in association with the World Health Organization Quality of Life Brief (WHOQoL-Bref), which is composed of four domains (physical, psychological, social relations and environment) because of the WHOQoL-Bref measures quality of life in a generic way [28]. Quality of life reflects subjective factors that involve the individual, his or her position, and perspectives regarding the future. Thus, we understand that the concept of quality of life is multidimensional, where it is necessary to live in a space that provides participation, representation, and autonomy for the elderly to be more active and independent [29]. Thus, the detailed evaluation of issues associated with autonomy and functional independence is important to identify the difficulties during the aging process, and how they would affect the elderly's quality of life. Moreover, it is important to remember that FI is an important indicator of healthy aging. Since many still associate the aging process with a state of disease [30]. Regarding the functionality and autonomy of the participants, the IVCF-20 instrument classified most of them as potentially fragile elderly, scoring from 7 to 14 points in the sub-items. This result expresses that the respondents present an imminent functional decline, i.e., some organic alterations are taking place that can lead to locomotor deficits, mood, cognition, and communication dysfunctions. However, it is worth pointing out that even with this imminent decline, these elderly people are still able to manage their lives independently and autonomously, which is why they are not classified as Fragile elderly people [31,32].

Assigning the concept of frailty to the elderly should take into consideration the vulnerability situation and functional dependence of the individual, based on biological, physical, cognitive and psychological issues, as well as socioeconomic factors such as gender, education and marital status and social participation. Thus, frailty is an association of clinical, functional and social-familial health conditions, therefore the environment in which the individual ages directly influence the way the process changes are faced [32]. It is worth pointing out that this study presents a positive view of aging due to the local reference and the riverside dweller's way of life. Because, the natural aging process, when analyzed with an emphasis on biological issues alone, describes that the functional limitations end up compromising the independence and/or autonomy of the elderly, which would directly imply a negative view of the process, as well as in the representation of the quality of life of these elderly people [33].

Conclusion

The authors conclude that the aging process in riverside communities suffered the direct influence of the SDH, which caused repercussions in their way of understanding quality of life. The sample showed positive answers as to the verification of the issues related to functional independence and autonomy. Although most of them were classified as elderly at risk of frailty, we could verify that their quality of life was not compromised. This can be

explained by the fact that the place where the individual lives, as well as the lifestyle, positively influenced the aging process, as well as environmental, social, and cultural issues, were prevalent factors in determining a good quality of life in riverside communities. It is stated that the aging of the riverine population is good and that DSS influenced functional independence. Thus, it is expected that the description of the aging process is analyzed in a multidimensional way, considering the particularities of each individual and their locality, so it is suggested that further studies are conducted to better describe this process by valuing the particularity of each individual and their locality.

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