



Health-related behaviors and associated factors among working older people within a Brazilian public university

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Abstract

Objective: To analyze health-related behaviors and associated factors in older people working at a Brazilian public university. **Method:** A cross-sectional, descriptive, inferential study adopting a quantitative approach was conducted. The sample comprised 113 individuals and data were collected between May/2021 and September/2022 either remotely by telephone and/or video calls, and/or in person. Descriptive and cluster analysis were performed and the Chi-square or Fisher's Exact Tests were applied for a significance level of 95%. **Results:** Respondents were predominantly male (n=70, 61.9%), had a mean age of 65 (± 3.20) years, and were of white (n=39, 34.5%) or brown (n=38, 33.6%) ethnicity. Two clusters were identified: Cluster01-fair, comprising 31 (27.4%) individuals; and Cluster02-excellent, comprising 82 (72.6%) participants, based on health-related behavior variables. A significant association was found between gender and clusters ($p < 0.04$). Cluster02 contained more males and individuals with better health-related behaviors. **Conclusion:** Although the results revealed that, overall, study participants had good/excellent behaviors, there was a contingent that reported health risk behaviors, highlighting the challenges surrounding self-care in the working older population. It is important to raise awareness of older individuals about health risk behaviors and their impact on health and quality of life, especially given that many older people are providers for the family and that working influences the health of older individuals.

Keywords: Elderly.
Health-related behavior.
Employment.

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INTRODUCTION

The study of health-related behaviors in older people is pivotal for public health because greater knowledge and understanding of these behaviors, together with regional and cultural specificities, contributes to the development of key markers of healthy aging with quality of life^{1,2}.

The older population has grown significantly worldwide as a result of declining fertility rates and increased longevity of the population as a whole³. This growth has led to a greater contingent of older individuals in the economically active population (EAP). This situation has created the need for changes within organizations to accommodate older workers, and the Brazilian labor market is not well prepared to effectively embrace the older EAP⁴.

Although the group of older workers is proportionally smaller than that of younger and adult workers, this older group has been growing steadily. This scenario of older Brazilians staying on in the workplace is not only due to financial reasons, but also as a means of remaining active and for socialization through work. Moreover, recent changes in the Brazilian welfare and pensions system has led to raising of the minimum retirement age of workers, representing another factor encouraging older individuals to carry on working⁵.

Thus, there is a real need to address the aging Brazilian work force and the need to adapt workplaces to cater for the specificities of these older workers. Older workers are the center of this process, which focuses on their physical and mental health, and can aid the planning and development of actions plans. This approach can help improve existing public policies or the devising of new policies that cater for the needs of older people and their well-being in the workplace while promoting active aging with quality of life^{5,6}.

Therefore, the objective of the present study was to analyze health-related behaviors and associated factors in older individuals working at a Brazilian public university. This knowledge can help inform health care policies for older economically active people, providing guidance to the research venue on organizing and planning its actions to meet the

needs identified. This is particularly relevant in the light of the new Brazilian public welfare and pension rules which, in many cases, have lengthened the time working before retirement. Health policies should help ensure that more older individuals reach late life in the best possible health.

METHOD

A cross-sectional, descriptive, inferential study with a quantitative approach involving older workers at a Brazilian public university was conducted. The contingent of older staff at the study venue in December 2020 was 845, comprising 504 administration technicians and 341 faculty teachers. In accordance with the methodological design, sample size was calculated based on a confidence interval of 95%, estimated proportion of 50%, and sampling error of 5%. The calculation yielded a final sample size of 265 participants, comprising both administration technicians and faculty teachers, subsequently stratified by sex and professional category. Inclusion criteria were older individuals who held permanent positions as administration technicians or faculty staff member at the target study venue. Subjects who were hospitalized, on sick leave, retired, or on vacation at the time of data collection were excluded.

Data were collected using the health, wellbeing and aging questionnaire (SABE)⁷ – Fortaleza version. The SABE questionnaire collects information on the following dimensions: personal details, cognitive status, health status, functional status, medications, health services use and access, work history, income sources, living arrangements and ill-treatment.

Health-related behaviors were defined as dependent variables and included sexual intercourse in past year, health service use in past year, last dental appointment, consumption of meat, fish or chicken at least 3 times a week, consumption of fruit or legumes at least twice a day, failure to take a prescribed medication in past year, daily engagement in physical activity, consumption of alcohol in past 3 months, smoking status, receipt of latest influenza and covid-19 vaccines, and reason for carrying on working. Sociodemographic characteristics were defined as independent variables and included sex, age group,

color/race, marital status, living arrangement, religion, income, educational level, and job position.

Recruitment and data collection were performed by 12 students (10 undergraduates and 2 graduates) selected via an application and shortlisting process, and duly trained. The collection instrument underwent review prior to commencement of interviews, entailing discussion of each question followed by pilot interviews and final review of the questionnaire for calibration of interviewers. Data collection began in May 2021 and concluded in September 2022. Questionnaires were applied either virtually (via telephone/video call) or in person. All participants signed the Free and Informed Consent Form before interview.

Descriptive analyses were carried out of the study variables. Additionally, multivariate cluster (interdependence) analysis was performed to identify groupings according to similarities or dissimilarities among participants for the dependent variables assessed. The hierarchical technique was employed and the agglomeration measure was the mean connection between observations. Regarding cluster quality, the cohesion and separation silhouette measure proved within the reasonable range, with a mean silhouette value of 0.4, yielding 2 clusters denoted Cluster01-fair and Cluster02-excellent.

The resultant clusters were used to determine significant associations between independent variables for a 95% significance level. Inferential statistics were determined using the chi-square or Fisher exact tests for a 95% significance level.

The project was approved by the Research Ethics Committees of the Universidade Federal do Rio Grande do Norte on 04 March 2020 under permit number 3.898.077 and registered on the Brazil/Health Ministry Platform under C.A.A.E 27248619.1.0000.5292.

The complete dataset for the results of the present study are available from the corresponding authors upon request.

RESULTS

A sample size of 265 individuals was calculated. A total of 201 (75.8%) individuals from the initial sample were contacted by telephone. Of the 201 contacted, 123 (61.2%) were administration technicians and 78 (38.8%) faculty teachers; 52 (25.8%) refused to take part in the study, of which 28 (53.8%) were administration technicians and 24 (46.2%) faculty teachers. Application of the exclusion criteria led to the exclusion of 36 (17.9%) participants, comprising 21 (58.3%) administration technicians and 15 (41.7%) faculty teachers. Reasons for exclusion were being retired (32 cases; 88.9%), due to death (3 cases; 30%) and because the worker had been seconded to another post (1 case; 2.80%).

Overall, 64 (24.2%) individuals could not be contacted due to situations which arose during the course of the study, such as the covid-19 pandemic and lockdown, outdated information on staff members at the service where the study was performed, and skepticism as to whether the study was bona fide.

Data for 113 respondents, or 42.6%, are presented. Of the overall sample, participants not contacted represented 24.2%, refusals 19.6%, and exclusions 13.6%.

The results of the descriptive analysis, with absolute frequencies and percentages of the categorical variables, are given in Tables 1 and 2.

The information in Table 1 shows that the sample consisted predominantly of individuals that were male, had a mean age of 65 (± 3.20) years, and were white or brown. Two of the participants failed to declare their color/race.

With respect to marital status, most participants were married, whereas for religion, the majority reported being Catholic. Regarding income, mean amount received was 9 ($\pm 6,3$) minimum wages. A significant number of respondents did not answer the question probing income.

Table 1. Characteristics of sample according to sociodemographic variables. Natal/Rio Grande do Norte state - Brazil, 2022.

Sociodemographic variables	n(%)
Sex	
Male	70(61.9)
Female	43(38.1)
Age group (years)	
60-64	55(48.7)
65-69	46(40.7)
≥70	12(10.6)
Color/Race	
White	39(34.5)
Brown	38(33.6)
Black	22(19.5)
Indigenous	04(3.50)
Yellow	03(2.70)
Other	03(2.70)
Not declared	04(3.50)
Marital status	
Divorced	15(13.3)
Separated	05(4.40)
Widowed	06(5.30)
Married	64(56.6)
Civil union	12(10.6)
Single	10(8.80)
Answer not given	01(0.90)
Religion	
Catholic	74(65.5)
Non-Catholic	28(24.8)
No religion	10(8.80)
Answer not given	01(0.90)
Income*	
1-3 minimum wages	05(4.40)
3.1-6 minimum wages	25(22.1)
≥6.1 minimum wages	34(30.1)
Answer not given	49(43.4)
Educational level:	
First grade (primary)	10(8.80)
Second grade (secondary)	14(15.9)
Higher education	18(15.9)
Graduate education	70(61.9)
Answer not given	01(0.90)
Living arrangement	
Alone	16(14.2)
With other(s)	97(85.8)

to be continued

Continuation of Table 1

Sociodemographic variables	n(%)
Position	
Faculty teacher	39(34.5)
Administration technician	74(65.5)

*Reference value for minimum wage in 2021.

Table 2. Characteristics of sample according to health-related behavior variables, Natal/Rio Grande do Norte - Brazil, 2022.

Health-related behavior variables	n(%)
Alcohol consumption in past 3 months	
None	46(40.7)
Less than 1 day per week	17(15.0)
1 day per week	13(11.5)
2-3 days per week	15(13.3)
4-6 days per week	01(0.90)
Every day	04(3.50)
Answer not given	17(15.0)
Smoking status	
Current smoker	07(6.20)
Ex-smoker	29(25.7)
Never smoked	48(42.5)
Answer not given	29(25.7)
Daily physical activity	
Yes	79(69.9)
No	27(23.9)
Answer not given	07(6.20)
Latest vaccine against influenza	
Yes	89(78.8)
No	16(14.2)
Answer not given	08(7.10)
Latest vaccine against covid-19	
Yes	101(89.4)
No	04(3.50)
Answer not given	08(7.10)
Sexual intercourse in past year	
Yes	71(62.8)
No	28(24.8)
Answer not given	14(12.4)
Last dental appointment	
<1 year ago	36(31.9)
1-2 years	25(22.1)
≥3 years	20(17.7)
Does not remember	32(28.3)

to be continued

Continuation of Table 2

Health-related behavior variables	n(%)
Other medical consultation in past year	
Yes	58(51.3)
No	46(40.7)
Answer not given	09(8.00)
Failed to take prescribed medication in past year	
Yes	15(14.2)
No	87(77.0)
Answer not given	10(8.80)
Consumption of fruit, legumes or vegetables (twice daily)	
Yes	75(66.4)
No	38(33.6)
Consumption of meat, fish or chicken (3 times/week)	
Yes	106(93.8)
No	07(6.20)
Reason for working	
Needs the money	35(31.0)
Wishes to help family	04(3.50)
Wants to keep busy	08(7.10)
Needs to feel useful	09(8.00)
Likes working	45(39.8)
Other	03(2.70)
Answer not given	09(8.00)

The results in Table 2 reveal that a quarter of individuals reported not having sexual intercourse. The rate of smoking was low, with the majority reporting never having smoked. Most engaged in weekly physical activity, over 70% were vaccinated against influenza and most against covid-19.

When probed about time since last dental appointment, most reported having seen a dentist within the past year, although a relatively large number of participants could not remember the date of their last visit.

Regarding failure to take a medication prescribed by a doctor in the past year, most stated this was not the case. Concerning the reason for carrying on working, most respondents reported that they enjoyed their work.

Significant associations among variables were explored by grouping individuals by similarity in responses for health-related behavior variables using cluster analysis. This analysis resulted in the

identification of 2 clusters: Cluster01-fair containing 31 (27.4%) individuals; and Cluster02-excellent with 82 (72.6%) participants. Some variables were dichotomized, such as health-related behaviors (dependent variables) and socioeconomic aspects (independent) to determine bivariate association.

The clusters are described in Table 3 according to smoking status, last dental appointment and consumption of fruit, legumes or vegetables (twice daily), where these were the only characteristics that distinguished the clusters.

In Cluster01-fair, all individuals were current smokers, reported not consuming fruit, legumes or vegetables at least twice daily, and most reported last dental appointment was over a year ago, characterizing poor/fair health-related behaviors. In Cluster02-excellent, most individuals never smoked or were ex-smokers, had last dental appointment within past year and consumed fruit, legumes or vegetables at least twice daily, characterizing good/excellent health-related behaviors.

Table 3. Bivariate association of clusters with health-related behaviors. Natal/Rio Grande do Norte state - Brazil, 2022.

Health-related behavior variables	Cluster01-fair n(%)	Cluster02-excellent n(%)	<i>p</i>
Alcohol consumption in past 3 months			
None or <1 day per week	06(13.0)	40(87.0)	0.68 ¹
≥1 day per week	08(16.0)	42(84.0)	
Smoking status			
Current smoker	04(57.1)	03(42.9)	<0.001 ¹
Never smoked / Ex-smoker	00(0.00)	77(100.0)	
Daily physical activity			
Yes	21(26.6)	58(73.4)	0.08 ¹
No	03(11.1)	24(88.9)	
Latest vaccine against influenza			
Yes	23(25.8)	66(74.2)	0.35 ²
No	02(12.5)	14(87.5)	
Latest vaccine against covid-19			
Yes	22(21.8)	79(78.2)	1.00 ²
No	01(25.0)	03(75.0)	
Last dental appointment			
<1 year ago	04(11.1)	32(88.9)	<0.001 ¹
≥1 year ago	26(57.8)	19(42.2)	
Other medical consultation in past year			
Yes	09(15.5)	49(84.5)	0.11 ¹
No	13(28.3)	33(71.7)	
Consumption of fruit, legumes or vegetables (twice daily)			
Yes	00(0.00)	75(100.0)	<0.001 ¹
No	31(81.6)	07(18.4)	
Consumption of meat, fish or chicken (3 times/week)			
Yes	27(25.5)	79(74.5)	0.09 ²
No	04(57.1)	03(42.9)	
Sexual intercourse in past year			
Yes	12(16.9)	59(83.1)	0.60 ²
No	06(21.4)	22(78.6)	
Failed to take prescribed medication in past year			
Yes	06(37.5)	10(62.5)	0.20 ²
No	18(20.7)	69(79.3)	
Reason for working			
Needs the money/Wishes to help family	26(32.5)	54(67.5)	0.06 ¹
Wants to keep busy/Needs to feel useful/Likes the work	03(12.5)	21(87.5)	

¹Chi-square; ²Fisher Exact

Table 4. Bivariate association of clusters with independent (sociodemographic) variables. Natal/Rio Grande do Norte state - Brazil, 2022.

Independent variables	Cluster01-fair	Cluster02-excellent	<i>p</i>
Sex	n(%)	n(%)	
Male	24(34.3)	46(65.7)	<0.04 ¹
Female	07(16.3)	36(83.7)	
Age group (years)			
60-65	20(29.0)	49(71.0)	<0.64 ¹
≥66	11(25.0)	33(75.0)	
Color/Race			
White	07(17.9)	32(82.1)	<0.08 ¹
Brown/Black	24(33.8)	47(66.2)	
Marital status			
Single/divorced/separated/widowed	09(25.0)	27(75.0)	<0.63 ¹
Married/civil union	22(28.9)	54(71.1)	
Religion			
Catholic	21(28.4)	53(71.6)	<0.60 ¹
Non-Catholic	09(23.7)	29(76.3)	
Income			
≤6 minimum wages	07(23.3)	23(76.7)	<0.79 ¹
>6.1 minimum wages	07(20.6)	27(79.4)	
Educational level:			
Primary/secondary	07(30.4)	16(69.6)	<0.72 ¹
Higher/Graduate education	24(26.7)	66(73.3)	
Living arrangement			
Alone	04(25.0)	12(75.0)	<1.00 ²
With other(s)	27(27.8)	70(72.2)	
Position			
Faculty teacher	23(31.1)	51(68.9)	<0.23 ¹
Administration Technician	08(20.5)	31(79.5)	

¹Chi-square; ²Fisher Exact

A significant association between sex and the clusters is evident in Table 4, where more men belong to Cluster-02-excellent (prevalence ratio (PR): 0.79; confidence interval (CI) 0.69-0.97). This is an inverse association of protection showing that men from Cluster02-excellent, the cluster with good/excellent health-related behaviors, has a lower probability of developing poor/fair health-related behaviors.

DISCUSSION

Studying the health-related behaviors of older people working at a Brazilian public university can

inform policies that can improve the quality of life of these individuals. Such efforts can promote a retirement without major losses, such as aging-related declines associated with the aging process that involve natural physiological changes inherent to human biology and physiology. These alterations can also be pathological as a consequence of diseases, result from changes in health-related behaviors or through adaptation in response to excess free time⁸.

With regard to the present study, analysis of the profile of the older participants revealed a predominance of males in the sample. Administration technicians and faculty teachers

tend to be male⁹ and so a predominance of men in the sample was expected.

It is public knowledge that, traditionally, women were always expected to remain in the home, with the role of the woman as carer and the man as provider. Amid shifts in family structures and advances in women's rights, females now make up a large contingent of the paid work force outside the home, although gender inequality persists in the labor market in Brazil^{10,11}.

With regard to age, although the study venue had a large contingent of older workers, these were generally younger old who, in developed countries, would not be considered old because they have not reached 65 years of age. A similar age was found among civil servants investigated in the study by Amorim et al.¹².

Although the study involved mainly younger old adults, given the recent changes in the labor market and retirement rules to reflect longer life expectancy, there is a greater need to promote health among this group of older workers who continue working beyond the age of 60¹².

The sample contained individuals who were predominantly white or brown. The socioeconomic data showed this to be a population with financial and marital stability and graduate level education. This profile was expected given the study venue of an institute of higher education, where the administration and faculty staff were incentivized to improve their qualifications, with concomitantly higher salary according to educational level attained. The majority of the participants were administration technicians.

Regarding the profile of health-related behaviors, most participants engaged in regular physical activity. In 2017, the study venue implemented a quality of life at work program providing individual and group work practices, organizational management and health promotion for staff administration and teaching staff³.

For vaccination status, most of the sample was vaccinated against both influenza and covid-19. Despite fake news and anti-vaccine campaigns which

peaked during the last government, the vaccination rate proved satisfactory. The study by Santos¹⁴ found that 96.5% of the older people interviewed were getting vaccinated and 100% believed the vaccine to be effective.

The adult population was the worst hit by covid-19 early in the pandemic, with greater lethality among the older population¹⁵. The study by Araújo et al.¹⁶ found that over half of the older individuals interviewed wished to receive the vaccine against covid-19. Given the vulnerability of this group, the high level of acceptance of the vaccine against covid-19 might be explained by fears of becoming infected by the disease and also by the greater knowledge and faith in science, since part of this group worked directly in the academic milieu.

Regarding the question on last dental appointment, a relatively high number of respondents stated they could not recall when they last saw a dentist. This suggests it may have been some time since their last visit to the dentist, highlighting the importance of health education on the need for oral health care.

For consumption of fruit, legumes or vegetables (twice weekly) and consumption of meat, fish or chicken (3 times/week), most participants confirmed this level of intake. According to the 2017-2018 household budget survey, older individuals consume more fruit, legumes and vegetables compared with adolescents and younger adults, despite a fall in levels relative to the previous survey in 2008-2009¹⁸.

Concerning the reason for carrying on working, most respondents reported they liked working, but a notable proportion reported needing the money as a reason. A growing number of older individuals decide to carry on working despite having reached retirement age. This phenomenon is due to several factors, such as the need to remain in the labor market and feel useful and valued, besides the financial motive.

The study by Pazos & Ferreira¹⁹ shows that the desire of many to carry on working is due to the income, being the breadwinner of the family, the social roles imposed, and also for reasons related to pensions. In agreement with the study by Mocelin et al.²⁰, there are also the consequences of biological

changes in the body and declines in health which force many older workers to give up their jobs.

In the case of the participants of the present study, these would receive less income upon retirement compared to the salary while working. This leads many of the administration and teaching staff to remain in the job so as not to have to lower their standard of living, despite aging-related biological changes.

Active aging and its relationship with work remains a fertile area of investigation and more in-depth continuous studies are warranted. The results of these studies can serve to support planning of new social initiatives, including the related legislation, culminating in enhanced quality of life in older age²¹.

In the cluster analysis, respondents were characterized for the variables smoking status, last dental appointment and consumption of fruit, legumes or vegetables (twice daily).

Based on the results, the individuals belonging to Cluster01-fair were deemed to exhibit poor/fair health-related behaviors given they reported being current smokers, having last dental appointment over a year ago, and not consuming fruit, legumes or vegetables (twice daily). Conversely, the participants in Cluster02-excellent were considered to display good/excellent health-related behaviors, having reported non-smoker/ex-smoker status, visiting the dentist within the last year, and consuming fruit, legumes or vegetables (twice daily).

Data from the Brazilian Institute of Geography and Statistics (IBGE)²² on tobacco use in the population show that 11.9% are smokers and 42.2% ex-smokers. Smoking is one of the leading causes of chronic non-communicable diseases (NCDs). Regarding dental appointments, these took place in private offices, with no stratification by age or length of time since last visit to the dentist. Consumption of fruit, legumes or vegetables (twice daily) was found to increase with age and education, where 17.9% of individuals aged ≥ 60 years had the recommended intake.

For the relationship between clusters and independent variables, a significant association

was detected between gender and the clusters. Male gender was associated with Cluster02-excellent, which exhibits good/excellent health-related behaviors. This finding contradicts the results of the studies by Assumpção et al.²³, Magalhães et al.²⁴, and Rocha et al.²⁵, which found feminization of aging and that women had better health-related behaviors.

Amid this paradox, the study by Fernandes & Burnay²⁶ showed that women have a greater probability of worse self-rated health, with worse overall health compared to men, irrespective of socioeconomic differences.

This phenomenon might be related to the fact that, historically and socially, women are more burdened with tasks involving the home, caregiving for children and spouse, besides holding down a job, thereby performing a “double work shift”^{24,27}. Due to this overload, these women are unable to practice good health-behaviors that allow disease prevention and health promotion.

Study strengths include the fact that it is an epidemiological investigation of working older individuals that analyzed health-related behaviors in this population, with few studies on the topic involving this age group.

Study limitations include the number of respondents, which fell short of the ideal sample size. This was due to multiple factors including non-receipt of up-to-date information on staff members, the interview having been conducted in a virtual environment, and numerous refusals to take part or answer calls owing to the high prevalence of telephone scams. The lack of previous studies addressing the specific topic in the older population also hampered comparisons.

Another limitation was that, owing to the covid-19 pandemic, the method of data collection had to be switched from in-person to virtual, hindering contact with participants. The fact that the study had to be conducted remotely may have introduced some information bias. Lastly, the cross-sectional design of the study precluded any inferences regarding causality.

CONCLUSION

As discussed throughout the text, more care needs to be dedicated to the health of the older population than currently, in view of the epidemiological and demographic changes taking place in Brazil that have led to shifts in sociodemographic, labor, behavioral and health profiles in the country.

Although the results show that, overall, most study participants exhibited good health-related behaviors, a contingent reported health risk behaviors, highlighting the challenges surrounding self-care in the older population.

These findings underscore the importance of raising the awareness of these older individuals about high risk behaviors and their impacts on health and quality of life. This is especially relevant given that many older workers are the main providers for their family and that working beyond the age of 60 is often a necessity as opposed to a choice in this stage of life.

Older people are remaining an active part of the workforce for longer. It is crucial that carrying on working, whether by choice or necessity, be supported while promoting the health of this group. Therefore, public actions and policies that contribute to healthy aging and also ensure the well-being of older individuals in the workplace are necessary.

The results of the present study serve not only to provide scientific evidence supporting the topic, but also to improve existing or develop new policies and actions for health promotion and disease prevention targeting the older population. Lastly, these findings can also help implement collective strategies addressing the actual needs of older workers at the Universidade Federal do Rio Grande do Norte which, together with existing occupational health services, can enable monitoring of the health and work activity of these civil servants.

AUTHORSHIP

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