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ORIGINAL ARTICLE

Factors Interfering in Vitamin D and Calcium Replacement in the Elderly: A Home Survey

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Highlights

1. Elderly people were exposed to the sun and did not replace vitamin D and calcium.
2. Perception of health and healthy lifestyle increases the life expectancy of the elderly.
3. Participating in social groups is a protective factor for the health of the elderly

ABSTRACT

This present work objective to analyse the frequency and factors associated to vitamin D and calcium replacement in elderly people living in the urban area of the city of Picos/PI. It consisted of a cross-sectional observational study, whose data come from the Populational Based Health Survey. A total of 143 elderly people, resident in the urban area participated. The data collected were vitamin D and calcium replacement, sociodemographic, health perception and lifestyle, performing inferential statistical analyses. The data showed that more than a half of the elderly were exposed to the sun, but did not replace vitamin D and calcium. It was observed that gender, schooling, health status, and participation in social activities are the main factors associated to replacement. It suggested that participating in social groups and being female is a protective factor protective for health. Relevant findings highlight to low replacement of vitamin D and calcium among the majority of studded elderly, and that many factors contribute to this condition.

Keywords: vitamin D; calcium; elderly; health promotion; surveys and questionaries.

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INTRODUCTION

Aging stimulates changes in three spheres: biological, social and psychological, where health care must be adequate, resolute and continuous[1]. Therefore, care related to the elderly should be linked, above all, illness prevention, early diagnosis and maintenance of a healthy lifestyle, since they are very important to face any health problems among this populational group[2].

The Pan American Health Organization (PAHO) defines that the way people live, the choice they make, is a part of lifestyle, which is considered in terms of the choices made and related directly with the context in which they are inserted. In this way, culture, habits acquired in the family and social context influence the lifestyle that is assumed by an individual or comunity[3].

The elderly population is growing rapidly worldwide and it will possibly to be one of the great challenges of public health to provide a qualified and effective care to serve this population effectively in the coming years. This phenomenon witch first occurred in developed countries, is now increasingly noticeable in developing countries[4].

In Brazil, it is estimated that in 2030, 18,8% of the entire Brazilian population will be 60 years age or older and by 2050, this percentage will reach 30%, so that the total number of elderly people aged 80 years or older will be greater than that of children under 4 years of age[5]. Thus, it is essential to insure the appropriated nutrients intake, which are essential to maintenance of health, since the scarcity or excess these can trigger several Chronic No-Communicable Disease. The elderly suffer from several important nutritional deficiencies, such as the case in especial vitamin D and calcium (Ca), due to a preference for carbohydrates-rich foods, where such deficiency can cause bony problems[6].

The calcium is a fundamental micronutrient for the mineralization of bones and teeth. In the body, this ion is largely found in the form of hydroxyapatite crystals, about 99%. It is main source, in the diet, can be found in milk and its derivatives, who provide more than 40% of the intake Ca, by adult's individuals, followed by cereals and derivates, with 30%[7].

Vitamin D, on the other hand, is a steroid hormone, that in human can be absorbed in two ways, endogenous pathway who happens through cutaneous synthesis and it is considerate the most relevant in terms absorptive and exogenous pathway which occur through the diet way (fish, eggs, fortified milk and vegetables), where its confer between 10% and 20% of physiological needs, which can be essential for elderly people, and/or those who a unable, due to pathology or climatic conditions, to be exposed to the sun in a healthy way, since the exposure allows to 80%-90% absorption of this vitamin[8].

This nutrient acts reciprocally in the bone metabolism, in special in range of peak bone mass, Ca has functions of constitution and regeneration of bone tissue, the synchronous action of parathyroid hormone and vitamin D maintain homeostasis of Ca levels in the body. The absence of that, specially, postmenopausal women and the elderly, contributes to muscle weakness, thus increasing the risk of falls and fracture in this population[9].

This way, the present study aims to analyse the frequence and factors associated whit vitamin D and calcium replacement in elderly people living in an urban area of the city of Picos-PI.

METHOD

The present work is an observational cross-sectional study, and the data were extracted from the Population Based Health Survey database in Piaui, whose collections took place in the city of Teresina and Picos-PI, carried out in the years 2018 and 2019[10], but for the present study only the elderly living in the Picos were evaluated.

The sample constituted of 143 elderly people (60 years or older), of both sexes, living in private households in the urban area, who agreed to participate of the research by signing the informed consent terms. Those who presented any disabilities or incapacity, who refused to integrate the search or whose selected household were closed after three attempts of different times, including one day in the final of week and/or holiday.

The variables were grouped into sociodemographic data, lifestyle and self-rated of health perception of these older adults. The demographics variables consisted of: gender, age, race, religion, marital status, education, whether have been in an active job and how many years have lived in the city. The variables related to the lifestyle adopted to these elderly people were: drinking alcohol, smoking practice, participation in organized social activities (clubs, community or religious groups, senior living centres, etc.) whether usually expose yourself to the sun, how long it this exposure and schedule, how long does calcium and vitamin D be replaced. The perception of health condition was classified in very good, good, regular, bad, very bad.

The date collect were realized in the household of participants and, to register of information, the research used forms of search inserted in Epicollect5®, which consist of a *software* developed specifically to collect and storage dates. With the propose is to guarantee an effective data collection and with a minimum of possible bias, the research group participated of a training which were realized in period of three weeks, aimed to standardize the form of collection all of dates of study,

After, the dates collected were exported to Excel for *Windows*, version 2010 and, following, migrated to the statistic program IBM Statistical Package for the Social Sciences (SPSS), version 26, where descriptives analyses and proceeded with statistical tests. The association analysis was performed using Fisher's exact test and the Logistic Regression Model to obtain the Odds Ratio (OR), with a confidence level of 95% and a significance of 5 %.

The ISAD-PI was approved by the Research Ethics Committee (CEP) of Ufpi (Opinion No. 2,552,426, of March 20, 2018), in compliance with the formal requirements set forth in Resolution 466/12 of the National Health Council (CNS)[11].

RESULTS

The table 1 describes the sociodemographic variables, the self-assessment of the participants' perception of health and lifestyle, as well as the replacement of vitamin D and calcium.

Table 1 – Characterization of sociodemographic profile, health perception, lifestyle, vitamin D and calcium replacement in elderly people who participated of the Population Base Health Survey in the city of Picos-PI. Picos, PI, Brazil, 2018

	N (%)	IC-95%	Media (IC-95%)	DP*
Sociodemographic Profile				
Sex				
Male	48(33,6)	(26,2-41,6)		
Female	95(66,4)	(58,4-73,8)		
Age group			69,89(68,65-71,12)	7,47
60|-70 years old	79(55,2)	(47,1-63,2)		
70|-80 years old	48(33,6)	(26,2-41,6)		
≥80 years old	16(11,2)	(6,8-17,1)		
Race				
White	39(27,3)	(20,5-35,0)		

Black	20(14,0)	(9,0-20,4)		
Brown	74(51,7)	(43,6-59,8)		
Other	10(7,0)	(3,7-12,0)		
Religion				
Catholic	109(76,2)	(68,8-82,6)		
Evangelical/Protestant	27(18,9)	(13,1-25,9)		
Other	7(4,9)	(2,2-9,4)		
Marital Status				
Married/Common-law relationship	69(48,3)	(40,2-56,4)		
Single/Separated/Windowed	74(51,7)	(43,6-59,8)		
Schooling				
Illiterate	51(35,7)	(28,2-43,7)		
Ens. Elementary (Complete/Incomplete)	64(44,8)	(36,8-52,9)		
Ens. Medium (Complete/Incomplete)	17(11,9)	(7,4-17,9)		
Superior/Post-graduate (Complete/ Incomplete)	11(7,7)	(4,2-12,9)		
Work				
Yes	26(18,2)	(12,5-25,1)		
No	117(81,8)	(74,9-87,5)		
Length of residence (Years)			50,80(45,59-56,02)	18,55
Health Status (Self- Assessment)				
Very good	7(4,9)	(2,2-9,4)		
Good	58(40,6)	(32,8-48,7)		
Regular	59(41,3)	(33,4-49,4)		
Bad	6(4,2)	(1,8-8,4)		
Very bad	13(9,1)	(5,2-14,6)		
Ingest alcohol beverage				
No, never have habit of drinking alcohol	72(50,3)	(42,2-58,5)		
Yes, but do not drink anymore	40(28,0)	(21,1-35,7)		
Yes, it has the habit of drinking alcohol	31(21,7)	(15,5-29,0)		
Smoke				
Yes	70(49,0)	(40,8-57,1)		
No	73(51,0)	(42,9-59,2)		
Participates in social activities				
Yes	41(28,7)	(21,7-36,5)		
No	102(71,3)	(63,5-78,3)		
Exposure to the sun				
Yes	86(60,1)	(52,0-67,9)		
No	57(39,9)	(32,1-48,0)		
Duration of Exposure to the sun (minutes)				
<15	40(46,5)	(36,2-57,0)		
15|-30	21(24,4)	(16,3-34,2)		
30|-60	14(16,3)	(9,6-25,1)		
≥60	11(12,8)	(7,0-21,0)		
Schedule of sun exposure				
Between 06:00 am and 07:00 am	18(20,9)	(13,4-30,4)		

Between 07:00 am and 08:00 am	22(25,6)	(17,3-35,5)
Between 08:00 am and 09:00 am	15(17,4)	(10,6-26,5)
Between 09:00 am and 10:00 am	15(17,4)	(10,6-26,5)
Between 16:00 am and 17:00 am	4(4,7)	(1,6-10,7)
Other	12(14,0)	(7,9-22,4)
Vitamin D Replacement		
No	125(87,4)	(81,2-92,1)
Yes	18(12,6)	(7,9-18,8)
Vitamin D replacement time (years)		
1|-|4 years	11(78,6)	(53,1-93,6)
5|-|8 years	3(21,4)	(6,4-46,9)
Makes calcium replacement		
Yes	28(19,6)	(13,7-26,7)
No	115(80,4)	(73,3-86,3)
Calcium replacement time (years)		
1|-|4 years	15(62,5)	(42,6-79,6)
5|-|8 years	5(20,8)	(8,4-39,8)
≥9 years	4(16,7)	(5,9-34,9)

CI – Confidence Interval

[1]-95% CI for ratio

[2]CI-95% for average

SD*- Standard Deviation

Source: ISAD-PI survey data.

The age range of the elderly ranged from 60 to 92 years (69.89±7.47), with a predominance of 60 to 70 years (55.2%), with the majority being female (66.4%) and self-declared brown (51.7%).

In terms of schooling, 44.8% reported having studied up to elementary school, and when asked about their marital status, there was a greater predominance of single/separated/widowed elderly (51.7%). In addition, there is a greater number of elderly Catholics (76.2%) who are not performing any type of work (81.8%). When asked about the length of residence in the city of Picos, the mean time was 50.80 ± years and SD* was 18.55[↑].

Regarding self-assessment of health perception, the majority (41.3%) self-assessed themselves as regular, while in lifestyle it was possible to note that the vast majority had never had the habit of consuming alcoholic beverages (50.3%) or smoking (51%). About participation in social activities, 71.3% did not participate. Concerning sun exposure, it was identified that 60.1% of the elderly stated that they were exposed to the sun, of those who performed the practice it was noted that the duration was less than 15 minutes (46.5%) and that the time from 7:00 am to 8:00 am was where the greatest exposure occurred (25.6%).

About the replacement of Vitamin D and calcium, it was possible to observe that 87.4% and 80.4% of these elderly do not perform it, and those who do it vary from 1 to 4 years, in both.

The following tables address the association tests performed between sociodemographic, self-rated health, and lifestyle variables to better identify factors linked to both vitamin D and calcium replacement.

Table 2 – Analyse of the association of sociodemographic profile, health perception and lifestyle with vitamin D replacement of elderly who participated of Populational-Based Health Survey in the municipally of Picos. Picos, Piaui, Brazil, 2018

	Vitamin D Replacement				
	Yes	No	P-valor[1]	P-valor[2]	OR(IC-95%)
	N(%)	N(%)			
Sociodemographic Profile					
Sex			**0,007**		
Male	1(2,1)	47(97,9)		**0,029**	**0,096(0,012-0,788)**
Female	17(17,9)	78(82,1)		-	-
Age group			0,182		
60|-70 years old	7(8,9)	72(91,1)			
70|-80 years old	7(14,6)	41(85,4)			
≥80 years old	4(25,0)	12(75,0)			
Race			0,315		
White	8(20,5)	31(79,5)			
Black	1(5,0)	19(95,0)			
Brown	8(10,8)	66(89,2)			
Other	1(10,0)	9(90,0)			
Religion			0,567		
Catholic	14(12,8)	95(87,2)			
Evangelical/Protestant	4(14,8)	23(85,2)			
Other	0(0,0)	7(100,0)			
Marital Status			0,874		
Married/Common-law relationship	9(13,0)	60(87,0)			
Single/Separated/Windowed	9(12,2)	65(87,8)			
Schooling			**<0,001**		
Illiterate	8(15,7)	43(84,3)		0,021	0,169-(0,038-0,762)
Ens. Elementary (Complete/Incomplete)	3(4,7)	61(95,3)		<0,001	0,040-(0,007-0,228)
Ens. Medium (Complete/Incomplete)	1(5,9)	16(94,1)		0,027	0,065-(0,006-0,736)
Superior/Post-graduate (Complete/Incomplete)	6(54,5)	5(45,5)		0,003	-
Work			0,405		
Yes	2(7,7)	24(92,3)			
No	16(13,7)	101(86,3)			
Health Status (Auto-assessment)			**0,028**		
Very good	0(0,0)	7(100,0)		0,999	-
Good	7(12,1)	51(87,9)		0,999	-
Regular	5(8,5)	54(91,5)		0,999	-
Bad	3(50,0)	3(50,0)		0,999	-
Very bad	3(23,1)	10(76,9)		-	
Ingest alcohol beverages			0,798		
No, never have habit of drinking alcohol	9(12,5)	63(87,5)			
Yes, but do not drink anymore	6(15,0)	34(85,0)			
Yes, it has the habit of drinking alcohol	3(9,7)	28(90,3)			
Smoke			0,924		
Yes	9(12,9)	61(87,11)			
No	9(12,9)	64(87,11)			
Participate of social activities			**0,032**		
Yes	9(22,0)	32(78,0)		**0,023**	**3,530(1,186-10,502)**
No	9(8,8)	93(91,2)		-	

[1]Fisher's Exact Test, at the 5% level; [2] Logistic Regression Model to obtain the Odds Ratio, at the level of 5%; *OR= Odds Ratio; Values in bold signify a statistically significant association by Fisher's Exact Test or OR.

Source: ISAD-PI survey data.

The table 2 demonstrate that vitamin D replacement predominate in elderly females (17,9%), where, by mean of Fisher's Exact Test (P-value[1]), it showed significative association (P<0,05[1]) with sex (P-0,007[1]), schooling (P-<0,001[1]), health status (P-0,028[1]) and if participate of social activities (P-0,032[1]). In relation to alcohol intake, the majority of elderly who undergo Vitamin D replacement say that they have never had habit of drinking or smoking

In reference to the logistic regression model (P-valor[2]) that is used to calculate the Oddis Ratio (OR), it exposed that elderly male are less liked to replace vitamin D when compared to female (OR= 0,096), in addition, expression that more than three times chance of elderly to participate of social activities do replacement (OR= 3,530).

Table 3 – Analyse of the association of sociodemographic profile, health perception and lifestyle with calcium replacement of elderly who participated of Populational-Based Health Survey in the municipally of Picos. Picos, Piaui, Brazil, 2018

	Calcium Replacement				
	Yes	No	P-value[1]	P-value[2]	OR(IC-95%)
	N(%)	N(%)			
Sociodemographic Profile					
Sex			**0,016**		
Male	4(8,3)	44(91,7)		**0,022**	**0,269(0,087-0,827)**
Female	24(25,3)	71(74,7)		-	
Age Group			0,771		
60|-70 years	14(17,7)	65(82,3)			
70|-80 years	10(20,8)	38(79,2)			
≥80 years	4(25,0)	12(75,0)			
Race			0,071		
White	12(30.8)	27(69.2)			
Black	1(5.0)	19(95.0)			
Brown	12(16.2)	62(83.8)			
Other	3(30.0)	7(70.0)			
Religion			0,414		
Catholic	24(22,0)	85(78,0)			
Evangelical/Protestant	3(11,1)	24(88,9)			
Other	1(14,3)	6(85,7)			
Marital Status			0,830		
Married/Common-law relationship	13(18,8)	56(81,2)			
Single/Separated/Windowed	15(20,3)	59(79,7)			
Schooling			0,846		
Illiterate	10(19,6)	41(80,4)			
Ens. Elementary (Complete/Incomplete)	11(17,2)	53(82,8)			
Ens. Medium (Complete/Incomplete)	4(23,5)	13(76,5)			
Superior/Post-graduate (Complete/Incomplete)	3(27,3)	8(72,7)			
Work			0,960		
Yes	5(19,2)	21(80,8)			
No	23(19,7)	94(80,3)			
Health Status (Auto-assessment)			0,407		
Very good	0(0,0)	7(100,0)			
Good	15(25,9)	43(74,1)			
Regular	9(15,3)	50(84,7)			
Bad	1(16,7)	5(83,3)			
Very bad	3(23,1)	10(76,9)			

Ingest alcohol beverages			0,445
No, never have habit of drinking alcohol	13(18,1)	59(81,9)	
Yes, but do not drink anymore	11(27,5)	29(72,5)	
Yes, it has the habit of drinking alcohol	4(12,9)	27(87,1)	
Smoke			0,585
Yes	15(21,4)	55(78,6)	
No	13(17,8)	60(82,2)	
Participate of social activities			0,166
Yes	11(26,8)	30(73,2)	
No	17(16,7)	85(83,3)	

[1]Fisher's Exact Test, at the 5% level; [2] Logistic Regression Model to obtain the Odds Ratio, at the level of 5%; *OR= Odds Ratio; Values in bold signify a statistically significant association by Fisher's Exact Test or OR.

Source: ISAD-PI survey data.

Table 3 shows a predominance of elderly females undergoing calcium replacement (25.3%). It is notorious that elderly males are less likely to undergo this replacement (OR=0.269).

With regard to alcohol intake, 18.1% of the elderly who underwent calcium replacement stated that they had never been in the habit of drinking alcohol, and as for the habit of smoking, there was a prevalence of 21.4%. When asked about participation in social activities, 16.7% of those who underwent calcium replacement did not participate in any social activity.

The table 4 shows the association between exposure to the sun and vitamin D and calcium replacement.

Table 4 – Analyse between replacement of vitamin D and calcium and exposure of the sun in elderly who participate of Populational-Based Survey in the city of Picos. Picos, Piaui, Brazil, 2018

	Sun Exposure				
	Yes	No	P-value[1]	P-value[2]	OR(IC-95%)
	N(%)	N(%)			
Vitamin D replacement			0,671	-	
yes	10(55,6)	8(44,4)			
No	76(60,8)	49(39,2)			
Calcium Replacement					
yes	12(42,9)	16(57,1)	0,037	0,04	0,416(0,179-0,963)
No	74(64,3)	41(35,7)			

[1]Fisher's Exact Test, at the 5% level.

[2] Logistic Regression Model to obtain the Odds Ratio, at the level of 5%.

*OR= Odds Ratio

Source: ISAD-PI survey data.

Thus, it is observed that 60.8% of the elderly who do not undergo vitamin D replacement are exposed to the sun and 64.3% who do not undergo calcium replacement are exposed, obtaining an OR of 0.416 (95%CI: 0.179-0.963) more likely to be exposed to the sun by those who do calcium replacement

DISCUSSION

When searching for a basis in the literature on the results found in the present study, it is noticeable to note that the prevalence of elderly females can be attributed to the fact that there is a greater number of women than men in Brazil, due to a lower exposure of women to various risk factors and better health care[12,13].

The high number of self-declared brown individuals in this study can be justified, mainly, by the great miscegenation existing in Brazil, since according to data from the last IBGE census (2010) it was possible to observe an increase from 38.5% to 43.1% among the brown population compared to the year 2000. And, the Piaui has the second highest percentage (70.9%) of brown individuals in relation to the states of the Northeast [14].

Regarding to low schooling, it is possible to note that it negatively influences the target audience in question, as pointed out in a study carried out in the city of Maringá, Paraná, where the higher level of education was a determining factor in finding a positive scenario of adequate nutritional status and better perceptions of health. This is justified because they tend to have a higher income, access to information, which enables more nutritious food choices that will reflect in a better state of health [15].

There was also a predominance of Single/Separated/Widowed in the marital situation, where studies show that living with a spouse is an important indicator of well-being in old age, as the material and emotional support offered in this type of arrangement contributes to greater functionality and longevity [16].

Self-assessment of health perception is an important piece of data to be investigated, as it can provide through an integral sphere, noticed by the individual their true health status, has a multi-dimensional influence and expresses objective and subjective aspects. A positive perception of the health condition in which the elderly find themselves is essential for them to be able to live in a balanced way and continue to interact with their families and society [17].

Concerning sun exposure, the results of a study carried out with elderly people in the city of Campinas, Sao Paulo, pointed out that when it occurs during daily and leisure activities, at times contraindicated by health agencies, even knowing the risk of developing skin cancer, and with body areas such as hands, arms and legs exposed, it is not a guarantee of an efficient absorption of vitamin D. This is in line with the findings of health agencies and demonstrates that in the present sample of this study, the majority of the elderly are following the appropriate recommendations [18]. However, in addition to sun exposure in order to absorb vitamin D, it is necessary to be aware of its relationship with calcium for the correct functioning of the body, regarding the fixation of calcium properties, because it is like a circuit, one is not effective without the other. What supports the need for a rich diet combined with correct exposure to the sun [19].

There was a significant association with gender, schooling, health status, and participation in social activities with the elderly who reported taking Vitamin D replacement. With regard to sex, it can be explained by the fact of women are more likely to develop disease who is directly linked to the consumption of this vitamin, as is the case with osteoporosis. Evidence shows that most cases of osteoporosis occur in postmenopausal women and the prevalence of the disease increases with age, from 4% in women aged 50 to 59 years to 52% in women over 80 years of age[20].

On the other hand, in the practice of social activities, it can be observed that it directly influences the quality of life of the elderly, as it interferes with the psychosocial health of this population, the fact of reaching old age already generates a feeling of dependence, of loneliness that often ends up limiting the performance of various activities[21]. The Covid-19 pandemic has further reinforced the relevance of the inclusion of these elderly people in community groups, community centers or clubs, because at the time of isolation the interference of social isolation in mental health and well-being was notorious, accentuating the prevalence of negative feelings, due to the lack of interaction between family and friends of these elderly people, as well as the impossibility of carrying out their daily activities, which greatly pruned their autonomy, leaving them increasingly fragile and dependent[22].

With regard to alcohol intake, the elderly who take vitamin D and calcium replacement reported that they never had the habit of ingesting any alcoholic beverage, which can be understood as a positive point for the health of the elderly. Since the excessive use of this licit drug can interfere in

several ways with the adequate nutrition of this population, due to the competition with nutrients from its intake to its absorption and use. The greater the share of alcohol in the diet, the lower the density and nutritional quality of the diet, which will mainly affect the bone health of these individuals, furthermore to causing their dehydration[23].

Instead, there was a greater predominance of non-smokers in the elderly who underwent vitamin D or calcium replacement. Tobacco consumption by the elderly may favor the emergence of comorbidities, increasing the spending of this age group on health care. It should be noted that this habit influences metabolic processes and concomitantly causes a reduction in appetite. In addition, smoking is often associated with the consumption of alcoholic beverages [24].

Not smoking or drinking alcohol, performing adequate physical activities, having a healthy diet and using medications correctly can contribute to the prevention of diseases, functional decline, in addition to increasing the longevity and quality of life of the individual, these factors being modifiable and can be worked on by the multidisciplinary health team in order to promote active and healthy aging [25].

The findings of the present study indicate that sociodemographic factors and health perception combined with a satisfactory lifestyle are important for an increase in life expectancy in the elderly. However, it is essential that the elderly have guidance and follow-up with health professionals who encourage the practice of physical activity in a correct and regular way, the importance of not using alcohol and cigarettes, the correct way to expose the sun, furthermore to the relevance of the correct intake of vitamin D and calcium to meet nutritional deficiencies.

Among the limitations found to achieve the objectives set, the memory bias, characteristic of age, as well as the lack of knowledge of the interviewees in relation to the time, in years, in which they underwent vitamin D and calcium replacement, which limited the collection of data, stands out.

FINAL CONSIDERATIONS

Through the implementation of this study, it can be evidenced done the results presented that most of the elderly stated that they did not replace vitamin D and calcium, with the variables gender, education, health status and participation in social activities being the main factors associated with this condition.

Although most of the elderly self-rated their health status as regular, this finding has contributions due to the fact of the low practice of social activities, which in turn directly influences the correct exposure to the sun and which was a determining factor in the findings of this research. For this reason, there is a need for this public to be assisted by a qualified health team that adopts coping strategies emphasizing a change in lifestyle habits, the need for a diet rich in these nutrients and correct exposure to the sun, contributing significantly to the quality of life of this public.

It is hoped that the results of this research will contribute to the promotion of the health of the elderly, in order to stimulate new studies in the area, in order to broaden the discussion on this theme and its influences on the health of the elderly, aiming to emphasize the importance of replacing vitamin D and calcium together with healthy habits. In addition to serving as a further study tool for students and health professionals.

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