

Physical, nutritional and psychological states interfere with health related quality of life of institutionalized elderly

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Abstract

Purpose Nursing home elders experience many problems that may influence their quality of life, in example of cognitive, mental, nutritional and physical disabilities. Concerning about elders' wellbeing may help them living with dignity. This study aimed to investigate factors associated with Health-Related Quality of Life (HRQoL) of institutionalized elders in a capital city of Brazilian Northeast. Methods A cross-sectional study was conducted with 193 institutionalized elders living in the metropolitan region of João Pessoa (Brazil). The following variables were tested regarding their association with the elders' HRQoL: Socio-demographic characteristics; Performance of daily-living activities, Frailty status, Cognitive status, Nutritional status, Self-perception of oral health and Depression status. Hierarchical multiple linear and logistic regressions analyses were performed in order to assess the impact of each independent variable on HRQoL, considering a significance level of 5%. Results The mean (SD) and the median of HRQoL of institutionalized elders were 62.69(15.24) and 62, respectively. Elderly were mostly (72.02%) female, being those with 80 years and over the more frequent (54.92%). Dependence on daily activities (OR=2.06, 95%CI=1.32-3.23), frailty (OR=1.68, 95%CI=1.15-2.45) and depression (OR=2.22, 95%CI=1.51-3.27) were statistically associated with poor HRQoL ($p<0.05$). Other variables have no significance within the adjusted model. Conclusions Dependent, frail and depressed institutionalized elderly presented a greater chance to have a worse HRQoL. It is necessary to plan and implement actions that would reduce the factors associated with the low quality of life of institutionalized elderly.

Introduction

A significant demographic transition has been experienced worldwide due to declining birth rates and increasing life expectancy, leading to an increase in the elderly population [1]. This phenomenon is particularly progressing fast in Brazil, and this may undertake Brazilian elderly population to rank sixth in 2020 [2]. Based on that, researchers have discussed and investigated the mechanisms associated with aging, especially the socio-cultural, psychological, and economic implications that involve this process. Although the population aging is a positive phenomenon, it also imposes many important public health challenges [3,4].

The World Health Organization (WHO) defines quality of life as the individual's perception of their position in life according to their culture and value system, which is affected in a complex way by the person's physical and psychological health, social relationships and personal beliefs [5]. In health sciences, the term 'quality of life' usually refers to how the individual's wellbeing may be affected by a disease or disability [6]. The Health-Related Quality of Life (HRQoL) is not a single entity, but a complex state comprised of several domains, including physical, emotional, spiritual, cognitive and social wellbeing [7]. In addition, socioeconomic and socio-demographic aspects of the social environment can strongly influence the HRQoL [8].

Increased life expectancy is associated with an increased age-related vulnerability and disability [2]. Although it is expected a greater susceptibility of the elder to physical and cognitive problems, strategies

may be implemented to reduce the impact of those health problems on their functional status, autonomy and independence [9]. Increasing prevalence of chronic diseases, such as depressive symptoms, mental health problems, polypharmacy and the presence of geriatric syndromes (dependence on daily-living activities, recurrent falls and urinary incontinence, for example) are strongly associated with the increased rate of institutionalization [10].

Some factors may be associated to quality of life worsening of institutionalized elders, including: loss of freedom and privacy, absence of family and friends, and feeling of abandonment. Reduction or even loss of functional capacity and decrease of cognitive abilities, such as memory and learning, may also worsen these individual's living conditions. Another relevant point is that daily activities are often carried out in the same environment, being the routine equal for all, a situation that contributes to the development of symptoms of depression and anxiety [11]. In this context, the worsening of health conditions is often related to elderly's institutionalization. As many of institutionalized elders face cognitive decline, few is known about their health related quality of life and its associated factors.

Based in this context and considering that institutionalization process has been related to a higher prevalence of comorbidities, including a significant functional and cognitive decline [12], identifying factors that can impact the quality of life may be a useful tool for the implementation of health promotion and prevention strategies for institutionalized elderly. A recent meta-analysis demonstrated that institutionalized elders have worse quality of life compared to home dwelling ones [13]. Considering the high concern with the quality of life of this population and the challenges in promoting elderly the opportunity to live with dignity, the present study aimed to determine factors related to Health-Related Quality of Life (HRQoL) of institutionalized elderly in a capital city of Brazilian Northeast.

Methods

Ethical Aspects

The Ethics Research Committee of Federal University of Paraíba approved this research protocol (CAAE: 66122917.6.0000.5188), in accordance with the ethical standards of the national research committee, as well as with the 1964 Helsinki declaration and its later amendments. All participants gave a free written informed consent.

Research Scenario

This study was carried out in a capital city of Brazilian Northeast (João Pessoa, Paraíba, Brazil - Latitude: 07° 06' 54" S, Longitude: 34° 51' 47" W). This municipality has 800,323 inhabitants, a human development index at 0.763 and a per capita gross domestic product of R\$23,169 (roughly US\$ 6,400). Within the metropolitan region of João Pessoa, there are seven long-term care institutions, which assist an average of 50 elders per institution. Institutions are philanthropic and most of costs are covered by elders' income (average US\$ 250 per month).

Subjects and Study Design

Institutionalized elderly population in the metropolitan region of João Pessoa consisted of 398 individuals. In a pilot study, we detected that the response rate was around 40%, since many of the institutionalized individuals had seriously cognitive impairment. A design effect of 1.4 was calculated and the sample size of 191 was set as representative of non-to-middle cognitive impaired elderly.

A cross-sectional study was then conducted with 193 institutionalized elderly people living in seven different long-term care facilities located in a capital city of Brazilian Northeast. Inclusion criteria required elderly to assimilate the methodological tools and agree to participate in the survey. Initial screening of participants was achieved after subjective evaluation and assessment of cognitive status with regards to space-time orientation. A minimum of 13 points within the Mini-Mental State Examination was determined to consider the elderly able to answer the research questionnaires. In addition, subjects with chronic degenerative diseases (i.e. Alzheimer disease and Parkinson disease) were not included within the study. Subjects answered the questionnaires after agreeing participate in the research and sign an informed consent.

Seven previously trained researchers took part in this survey. Training of researchers involved a theoretical exposition of all validated instruments, as well as a clinical experience to set the collection procedure. Concordance was set within the group of examiners as above 0.9.

Questionnaire and Variables

The following independents variables were included in the present study: socio-demographic characteristics (sex, age, education level, retirement and family visits) and data associated with general health (Performance of daily-living activities, Frailty status, Cognitive status, Nutritional status, Self-perception of oral health and Depression status). Health-Related Quality of Life of life – HRQoL was considered a dependent variable in this study. All data were collected using validated questionnaires, which were used to interview the subjects.

Performance of Daily-Living Activities (Katz scale)

The performance of daily-living activities was assessed using a six items questionnaire that measured the individual's performance in self-care activities, including the following domains: 1) feeding; 2) sphincter control; 3) transference; 4) personal hygiene and use of the toilet; 5) dressing ability; 6) taking a shower [14]. Each dependence score was considered one point. In this survey, participants who were dependent of two or more functions were considered dependent.

Frailty Status

Frailty status was evaluated using a self-reported instrument validated by Nunes et al. [15] and adapted from the original instrument proposed by Fried et al. [16]. According to this instrument, five criteria are evaluated: non-intentional weight loss and muscle force reduction, poor endurance and energy, slowness

and low physical activity level. In this survey, participants were categorized as frail when they have three or more positive scores for frailty. Muscle force was evaluated using a handgrip dynamometer; however, the handgrip force was not included in the statistical model

Cognitive Status

The Mini-Mental State Examination (MMSE) was used to measure the cognitive impairment and used as a screening for dementia [17]. The MMSE is composed of typical questions grouped into seven categories, each of which aims to evaluate specific cognitive functions: orientation to space-time, word registration, attention and calculation, word recall, language, and visual construction [18]. In this survey, elderly were included in two categories: with no cognitive impairment (≥ 21 points) or with cognitive impairment (< 21 points).

Nutritional Status

The Mini Nutritional Assessment Short Form (MNA-SF) is a well-validated technique for evaluating the risk of malnutrition among elders without the help of a dietician or nutritionist. It is based on anthropometric measurements, a global assessment of general health status and a subjective assessment (self-perception) of health and nutrition. Higher score indicated a more satisfactory state of nutrition [19]. In this survey, elderly were included in two categories: normal (≥ 8 points) or undernourished (< 8 points).

Self-Perceived Oral Health

The Geriatric Oral Health Assessment Index (GOHAI) was used to assess the self-perception on elderly's oral health. For this, a 12 items questionnaire analyzed the physical function, psychosocial function and pain or discomfort. It pays special attention to problems related to food ingestion, which are addressed by at least one item in all three dimensions of the index: 'trouble biting or chewing food' (functional limitation), 'discomfort when eating' (pain and discomfort), 'uncomfortable eating in front of people' (psychological impacts), and 'limit kinds or amounts of food' (behavioral impacts) [20]. Voluntaries answered questions as never (score 3), sometimes (score 2) and always (score 1). In this survey, elders were included in two categories: good perception (≥ 34 points) or bad perception (< 34 points).

Depression Status

The Geriatric Depression Scale (GDS) was used to assess depression, using a 15 items depression scale. It was developed to exclude the effects of non-specific somatic symptoms such as anorexia and insomnia, which are frequently observed among elderly populations [21,22]. Each item can have 2 answers (yes or no). The highest possible score is 15, which indicates the most severe depressive state [23]. In this survey, participants were included in two categories: without depression (≤ 5 domains) or suggestive of depression (> 5 domains).

Health-Related Quality of Life (HRQoL)

HRQoL was measured using the short form instrument, that consists of 12 items measuring the following eight concepts: physical functioning; role physical due to physical problems; role emotional due to limitations in emotional health; mental health; bodily pain; general health; vitality; and social functioning, which can be combined into two sum scales, physical and mental sum scales, that reflect physical and mental health, respectively [24].

In this survey, participants were included in two categories, according to the median value found in this study: bad HRQoL (< 62 points) or good HRQoL (\geq 62 points).

Theoretical-Conceptual Model

A theoretical-conceptual model was designed for this study (Figure 1), in order to determine factors related to Health-Related Quality of Life (HRQoL) of institutionalized elderly involved in this survey. Block 1 included distal independent variables (sex, age, education level, retirement and family visits). Block 2 included proximal independent variables related to general health (Performance of daily-living activities, Frailty status, Cognitive status and Nutritional status, Self-perceived oral health and Geriatric Depression Scale).

Statistical Analysis

A descriptive analysis was conducted to check absolute and relative distributions, as well as to calculate means, medians and standard deviations of data. Data were analyzed using IBM Statistical Package for Social Sciences software (IBM SPSS, v. 20, Chicago, IL). The independent variables were evaluated with regards their association with HRQoL through the use of two statistical regression models (multiple linear and multiple binary logistic), as shown in Figure 1. For multiple linear regression model, variables were used in their continuous form (i.e.: number of dependent functions, MNA score). Variables analyzed under multiple binary logistic model were dichotomized as described before. Initially, all variables were included within the unadjusted models, using the hierarchical approach presented in Figure 1. Variables within each block were analyzed with regards their significance. Variables with p-value above 0.20 were progressively removed using the Backward-Wald method. A significance level of 5% was the criterion for a statistically significant effect. Odds ratios (ORs) were reported with 95% confidence intervals (95%CI). Statistical B-coefficient (regression coefficient) was considered to continuous variables included in the model. B-coefficient reported how much every increment of the independent variable would increase chances to have an HRQoL impact.

Results

Out of 193 institutionalized elders included in this study, 139 (72%) were female, being those elders aged 80 years and over the most frequent (54.9%, n=106). Retired institutionalized elders consisted of 86% of the sample and 66.3% of them received visits from their relatives.

Table 1 shows the distribution of independent variables according to HRQoL. The mean and the median of HRQoL within institutionalized elders were 62.69 (SD = 15.24) and 62, respectively. The median value was used to dichotomize the HRQoL.

The linear regression analysis showed statistically significant values ($p < 0.05$) for the following independent variables: performance of daily-living activities, frailty status and depression status. For socio-demographic variables (sex, age, educational level, retirement and family visits), no statistically significant associations were found ($p > 0.05$). When the level of dependence in daily activities and the level of depression in the elderly increased, HRQoL decreased by 1.026 and 1.500, respectively. In addition, the HRQoL decreased by 5.615 when the frailty status of the institutionalized elderly increased (Table 2).

The multiple binary logistic regression model revealed that dependent (OR=2.064, 95%CI=1.319-3.228), frail (OR=1.76, 95%CI=1.146-2.45) and depressed (OR=2.225, 95%CI=1.514-3.270) institutionalized elderly presented a higher chance to have a worse HRQoL (Table 3). This is important because the general quality of life can be improved once long-term care institutions develop actions to avoid dependency, frailty and depression among residents.

Discussion

The results of this study point out institutionalized elderly have low HRQoL and the main factors that influence their quality of life are associated with their performance of daily-living activities, functional status and depression status. Once institutions could promote activities to reduce dependency, frailty and depression, the institutionalized elderly's quality of life can be significantly improved.

Brazil has an important cultural diversity and socioeconomic inequalities, resulting in heterogeneous institutions for elderly with regards to provision of services, physical structure, financial resources and the strata of public served [25]. In this context, it is evident that the quality of life experienced by different elders may vary within the same institution and among different places. However, this study point out that long-term care facilities may improve the way-of-life of their residents through physical and mental health promotion activities, which may impact positively their general health-related quality of life [26].

A substantial impact of physical, cognitive and psychological disabilities on HRQoL of institutionalized elderly has been demonstrated [27]. According to this previous study, providing psychological, physical and occupational interventions could significantly improve HRQoL of nursing home residents. The results of our study corroborate with those previously reported, since it was also detected a relationship between physical (performance on daily-living activities and frailty status) and psychological (depression status) status on HRQoL of institutionalized elderly.

Some studies emphasized that institutionalization process result in a worse quality of life [13]. Although institutionalized elderly have low HRQoL, this condition is possibly associated with factors that led them to institutionalization, such as very advanced age, low scholarship, low autonomy and low social

participation [13,28,29]. Investigating factors associated with the perceived quality of life of institutionalized and non-institutionalized elderly is of relevance to determine the effects of institutionalization on the HRQoL [30]. In this study, only the HRQoL of institutionalized elderly was investigated as dependent variable.

According to our data, dependency was associated with worse HRQoL of institutionalized elderly. The reduction in the body mass and loss of muscle tone are characteristics involved in aging process and these factors imply in the reduction of movements and decrease of functional performance during daily activities [31,32]. The lack of physical stimulation in institutions increases the probability of functional disorders in elderly, which affects their HRQoL [33]. A previous study has demonstrated that lower levels of physical activity were associated with institutionalization [34].

In addition to a pre-existent condition, long-term care institutions frequently limit elderly's active lifestyle due to the lack of sufficient personnel and infrastructure [13,35]. In our study, none of the institutions investigated presented a regular program of physical activities for the elderly and this fact may be related to the reduced number of employees. In general, institutions have small number of professionals that are required to perform many functions, including the practice of regular physical activities among elderly.

Although this study did not show an impact of nutritional status on the HRQoL of institutionalized elderly, previous studies have shown that malnutrition may contribute to increased mortality and greater susceptibility to infections, which may reduce the elderly's quality of life [36,37]. Other studies emphasize malnutrition is related to functional disability, as result of muscle strength decrease and reduction of cardiorespiratory performance [38,39].

The relationship between frailty and HRQoL may also be associated with the functional disability, with regards to physical, cognitive, social and psychological domains [40]. The poor health status increases the incidence of elderly's mortality, hospitalization and institutionalization [40], which obviously impact the HRQoL. Poor nutritional status frequently accelerates the onset of frailty and predisposes elderly people to chronic diseases [41]. Therefore, frail elderly must be subjected to nutritional supplementation and physical activities in order to improve functional performance, nutritional status and the overall quality of life [42].

The overall prevalence of frailty in the community-dwelling population of western countries has been reported to range from 6% to 40% [43,44,45,46]. We detected that 46.1% of participants were considered frail, and this impacted significantly the HRQoL of institutionalized elderly. Although there is evidence of the large benefits of exercising in improving functional and mental domains of elderly's quality of life, no recommendations have been made to date concerning the structure of exercise programs directed to frail institutionalized elderly [47,48]. None physical exercise programs were observed within the institutions visited in our study. Valid interventions for community-dwelling older adults are not necessarily valid for nursing home populations, since institutionalized elderly have higher rates of disability, multiple morbidities, and geriatric syndromes [42].

Depression is the most prevalent functional mental disorder in elderly people. It is projected that depressive illness will be the second leading cause of disability worldwide in 2020 [49]. The degree of unhappiness and suffering in people with depression is not easily measured, although one possible way is to assess the impact of depression on their quality of life. Even minor levels of depression have been related to a significant quality of life decrease among elders [50]. The results of this survey showed that depression status was associated with lower HRQoL among institutionalized elders. Developing programs for psychological monitoring and depression prevention are therefore necessary. This would aid reducing the negative effects of depression on HRQoL. Although GDS is not a valid instrument for diagnosing depression, it has an excellent applicability in long-term care institutions. GDS can contribute to monitoring the prevalence of symptoms related to depression [51].

The relationship between depression and poor quality of life perception among elders has been demonstrated previously [52]. The loss of independence and privacy within long-term care institutions can aggravate the depression status among institutionalized elders [34]. Psychological illness is usually associated with lower life enjoyment and demotivation, which implies in lower functional capacity and lower quality of life [52].

The results of this study did not find statistical associations between geriatric self-perceived oral health (GOHA) and HRQoL. The oral health of institutionalized elderly was previously characterized by high frequency of tooth loss, lack of regular preventive care and lack of dental treatment [53,54]. This illustrates that oral health is undervalued among institutionalized elders. Therefore, the self-perceived oral health does not seem to impact the HRQoL of institutionalized elders. Nevertheless, improvement of elders' oral health would possibly impact the masticatory function, nutritional status and self-esteem.

It is important to consider this is a cross-sectional study and statistically significant associations may not always represent a cause-effect relationship. Although the sample size can be considered limited, this was set by a statistical calculation and it represents the whole number of institutionalized elderly that could answer the validated questionnaires. The results of this study can be set as representative of institutions from the capital cities of Brazil Northeast, as well as other countries with similar economical status or long term care institutions structure. Results of this study could aid institutions to promote physical and psychological interventions to prevent dependence, frailty and depression among institutionalized individuals.

Conclusions

In our study, dependent, frail and depressed institutionalized elders presented a higher chance to have worse HRQoL. These findings emphasize the need to plan and implement strategies to impact significantly the quality of life of institutionalized elders. In addition, the inclusion of physical activities programs and recreational activities may contribute positively to the recovery of the physical and mental state of these individuals, allowing them to live with dignity and better quality of life.

List Of Abbreviations

GDS – Geriatric Depression Scale

GOHAI – Geriatric Oral Health Assessment Index

HRQoL – Health Related Quality of Live

MMSE – Mini-Mental State Examination

MNA-SF – Mini Nutritional Assessment – Short Form

OR – Odds Ratio

SD – Standard Deviation

WHO – World Health Organization

95%CI – 95% Confidence Interval

Declarations

Ethics approval and consent to participate

All procedures performed were in accordance with the ethical standards of the institutional and national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. The Ethics Research Committee of the Health Sciences Center from Federal University of Paraiba approved this research protocol (CAAE: 66122917.6.0000.5188). Written informed consent was obtained from every person that participated in the survey.

Consent for publication

All participants agreed to participate the study and signed an informed consent, which also gave consent for publication.

Availability of data and material

The datasets used for this study is available from the corresponding author on reasonable request.

Competing interests

IPSF and LASM received MSc scholarship from CAPES and they declare no conflicts of interest. All other authors were not sponsored and they declare no conflict of interest. The authors declare that they have no competing interests.

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Authors' contributions

IPSF, LASM and YWC conceptualized and designed the study. IPSF, LASM, RLW and JCXP participated in data collection and contributed to the construction of dataset. ACP, LFDA and YWC analyzed and interpreted data. IPSF, LASM, RLW and JCXP drafted the manuscript. ACP, LFDA and YWC revised the manuscript for important intellectual content. All authors read and approved the final version of the manuscript.

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Tables

Table 1 - Distribution of independent variables according to HRQoL.

Independent Variables		HRQoL			
		Good		Bad	
		(≥ 62 points)		(< 62 points)	
		N	%	N	%
Sex	Male	29	15.0	25	13.0
	Female	66	34.2	73	37.8
Age	< 80 years old	42	21.8	44	22.8
	≥ 80 years old	53	27.5	54	27.9
Educational level	Primary, secondary or higher education	51	26.4	53	27.5
	Literate or illiterate	44	22.8	45	23.3
Retirement	Yes	80	41.5	87	45.1
	No	17	8.8	9	4.6
Family visits	Yes	65	33.7	64	33.1
	No	32	16.6	32	16.6
Performance of daily-living activities	Independent (dependent of ≤ 1 function)	86	44.6	56	29.0
	Dependent (dependent of ≥ 2 functions)	9	4.7	42	21.8
Frailty status	Not Frail (< 3 points)	68	35.2	36	18.7
	Frail (≥ 3 points)	27	14.0	62	32.1
Cognitive Status	No Cognitive impairment (≥ 21 points)	49	25.4	46	23.8
	Cognitive Impairment (< 21 points)	46	23.8	52	26.9
Nutritional Status	Normal (≥ 8 points)	76	39.4	61	31.6
	Undernourished (< 8 points)	19	9.8	37	19.2
Self-perceived oral health (GOHAI)	Good perception (≥ 34 points)	47	24.4	51	26.4
	Bad perception (< 34 points)	48	24.9	47	24.4
Depression status	Without depression (≤ 5 domains)	78	40.4	40	20.7
	Suggestive of depression (> 5 domains)	17	8.8	58	30.1

Table 2 - Unadjusted and adjusted multiple linear regression models to predict variables associated with the Health-Related Quality of Life (HRQoL) among institutionalized elderly. Statistically significant linear regression coefficients (B and Beta) result in an impact on HRQoL score.

UNADJUSTED MODEL	Unstandardized Coefficients		Standardized Coefficients	T	p-value	Collinearity Statistics	
	B	S.E.	Beta			Tolerance	VIF
Age (\geq 80 years)	-0,056	0,106	-0,033	-0,529	0,598	0,912	1,096
Sex (Male)	-0,555	2,085	-0,017	-0,266	0,791	0,907	1,103
Education (lower)	2,426	1,942	0,079	1,249	0,213	0,874	1,145
Retirement (no)	4,237	2,873	0,092	1,475	0,142	0,912	1,097
Family visits (no)	-2,002	2,125	-0,061	-0,942	0,348	0,846	1,183
Dependent elderly	-0,918	0,562	-0,115	-1,634	0,104	0,708	1,412
Frail elderly	5,652	1,374	0,294	4,114	<0,001	0,692	1,444
Undernourished	0,197	0,291	0,048	0,679	0,498	0,711	1,406
Oral Health - GOHAI	0,294	0,207	0,084	1,376	0,171	0,946	1,058
Depressed elderly	-1,449	0,301	-0,346	-4,819	<0,001	0,685	1,460
Cognitive impaired	-0,009	0,149	-0,004	-0,061	0,951	0,730	1,370
ADJUSTED MODEL	Unstandardized Coefficients		Standardized Coefficients	T	p-value	Co-linearity Statistics	
	B	S.E.	Beta			Tolerance	VIF
Retirement (no)	3.567	2.718	0.077	1.312	0.191	1.000	1.000
Dependent elderly	-1.026	0.506	-0.129	-2.028	0.044	0.858	1.166
Frail elderly	-5.615	1.321	-0.292	-4.250	<0.001	0.735	1.361
Oral Health - GOHAI	0.294	0.202	0.087	1.454	0.148	0.974	1.027
Depressed elderly	-1.500	0.286	-0.358	-5.243	<0.001	0.742	1.347

Table 3 – Unadjusted and adjusted Multiple binary logistic regression models to predict variables associated with the Health Related Quality of Life (HRQoL) among institutionalized elderly. Variables with statistically significant Odds Ratio (OR) impacted negatively the HRQoL score.

UNADJUSTED MODEL	B	S.E.	Wald	p-value	OR (Exp(B))	95% C.I.	
						Lower	Upper
Age (\geq 80 years)	-0,027	0,155	0,030	0,862	0,973	0,718	1,320
Sex (Male)	-0,156	0,169	0,852	0,356	0,856	0,615	1,191
Education (lower)	-0,100	0,158	0,400	0,527	0,905	0,664	1,233
Retirement (no)	-0,346	0,239	2,097	0,148	0,707	0,443	1,130
Family visits (no)	0,067	0,168	0,156	0,693	1,069	0,768	1,487
Dependent elderly	0,727	0,229	10,084	0,001	2,069	1,321	3,240
Frail elderly	0,700	0,180	15,150	0,000	2,013	1,415	2,863
Undernourished	0,214	0,210	1,039	0,308	1,239	0,821	1,869
Oral Health - GOHAI	-0,273	0,178	2,346	0,126	0,761	0,536	1,079
Depressed elderly	-0,053	0,196	0,074	0,786	0,948	0,646	1,392
Cognitive impaired	0,812	0,202	16,232	0,000	2,253	1,517	3,344
ADJUSTED MODEL	B	S.E.	Wald	p-value	OR (Exp(B))	95% C.I.	
						Lower	Upper
Retirement (no)	-0.465	0.289	2.601	0.107	0.628	0.357	1.105
Dependent elderly	0.725	0.228	10.075	0.002	2.064	1.319	3.228
Frail elderly	0.517	0.194	7.088	0.008	1.676	1.146	2.452
Oral Health - GOHAI	-0.323	0.189	2.926	0.087	0.724	0.500	1.048
Depressed elderly	0.800	0.196	16.592	<0.001	2.225	1.514	3.270

Figures

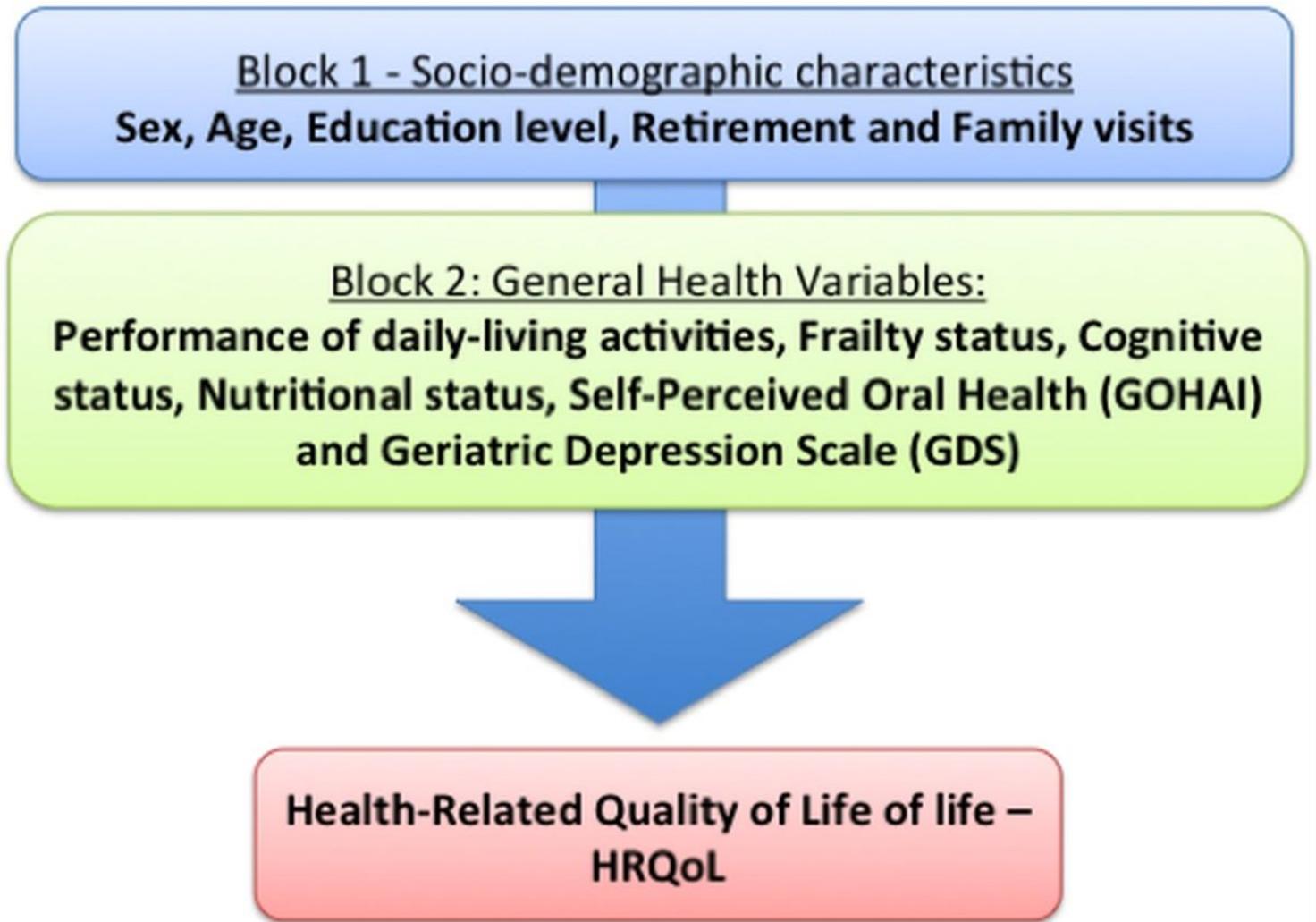


Figure 1

Theoretical-conceptual model of factors that would determine the Health-Related Quality of Life (HRQoL – dependent variable) of institutionalized elderly.