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Negative self-assessment associated with real health status and quality of life in adults

Autoavaliação negativa associada ao estado objetivo da saúde e à qualidade de vida em adultos

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ABSTRACT
The prevalence of negative self-rated health and associated factors in adults are estimated. A survey was conducted with adults aged 18 to 59 years, from urban and rural areas in the municipality of Rio Branco AC Brazil, in 2014. The possible factors associated with self-evaluation were verified by multiple logistic regression. The prevalence of negative self-rated health was 12.1%, associated with age, stress (OR: 1.87; 95% CI: 1.04-3.38), use of medicine (OR: 2, 23; 95% CI: 1.19-4.20) and self-reported insomnia (OR: 2.33; 95% CI: 1.20-4.53) or depression (OR: 2.03; 95% CI: 1.02-4.04). Low-density lipoprotein and the lower tercile of the physical and psychological domains of life quality were also associated. Results show that self-rated health reflected physical and psychological conditions and actually assessed the individual's overall health status.

Keywords: Adult health. Health surveys. Self-evaluation.

RESUMO
O objetivo do presente estudo foi estimar a prevalência de autoavaliação negativa da saúde e os fatores a ela associados em adultos. Para tanto, realizou-se um inquérito com adultos de 18 a 59 anos, das zonas urbana e rural do município de Rio Branco, Acre, no ano de 2014. Os possíveis fatores relacionados a tal autoavaliação foram verificados por regressão logística múltipla. A prevalência de autoavaliação negativa da saúde foi de 12,1%, estando associada a idade, estresse (OR: 1,87; IC 95%: 1,04-3,38), uso de medicamentos (OR: 2,23; IC 95%: 1,19-4,20) e autorrelato de insônia (OR: 2,33; IC 95%: 1,20-4,53) ou depressão (OR: 2,03; IC 95%: 1,02-4,04). A lipoproteína de baixa densidade também esteve associada, bem como o tercil inferior dos domínios físico e psicológico da qualidade de vida. Conclui-se que a autoavaliação de saúde refletiu as condições físicas e psicológicas e constitui uma medida do estado global de saúde do indivíduo.

Palavras-chave: Autoavaliação; Inquéritos de saúde; Saúde do adulto.

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INTRODUCTION

Health self-assessment is the result of biological, social and psychological factors involving the perception that people have on their health, or rather a personal and subjective idea[1]. It is actually the result of an analysis that everyone does with regard to their physical and emotional health, its cognition, functionality, social behavior and the manner these factors affect the general well-being and satisfaction with life[2].

The World Health Organization (WHO) recommends health self-assessment to be regularly incorporated into health surveys[3]. It is taken into account so that life quality, morbidities and predictor of life expectancy could be evaluated[4].

The prevalence of negative self-assessed health depends on the population which is being researched and on the classification adopted. In the case of studies with categories "bad" and "very bad", the prevalence ranged between 29.5% in China[5] and 4.3% in Brazil[6]. The factors employed by people to classify their health status include different aspects, namely, sociodemographic indicators, life habits, health conditions and life quality[7,8]. Further, the identification of factors that impact early health self-assessment of health is crucial, and the role of biomarkers is discussed – one of them is LDL-c (low-density lipoprotein) due to its association with the occurrence of atherosclerotic cardiovascular disease[9,10].

Research on the theme within different situations contributes towards the elucidation of differences in a continental-size country such as Brazil. The study of health self-assessment in the Amazon region provides information on regional limitations imposed by distance from large metropolitan areas which result in lower health access rates. The importance of studies on objective and subjective data of health conditions is worth mentioning since they take into account the biological and psychosocial aspects of each.

Current study estimates the prevalence of negative self-assessment of health and verifies factors associated with it in adult population in Rio Branco AC Brazil.

METHODOLOGY

Current population-based transversal study undertaken with data retrieved from the Chronic Diseases Study (EDOC)[11] is foregrounded on a pilot research with two household researches. The research has employed 18-59-year-old adults (Edoc-A), residents of the urban and rural zones of the municipality of Rio Branco AC Brazil.

All people living in the above-mentioned areas were included in the study. Exclusion criteria comprised pregnant females and those with cognitive impairments that would impair communication or lack of understanding the questions involved. Research employed a cluster sampling plan in two stages, or rather, (1) selection of sectors with a probability that was proportional to the number of households observed in CD2010, and (2) selection of households. Sample size of Edoc-A was determined by assuming a prevalence of alteration in renal function of 15% among adults (18 to 59 years), with a 95% degree of confidence and an absolute error of 3%. More information about the sampling plan may be found in the methodological article[11].

Data were collected between April and September 2014. Interviews with questionnaires on social, economic and demographic conditions, habits and health conditions were undertaken in the homes. Serum collection and physical evaluation were scheduled, with the guidelines for these procedures. In the case of the collection of biological samples, a 12-hour fasting was requested. Anthropometric measurements comprised height, mass and body perimeters.

Blood samples were obtained by collecting peripheral blood, with previous antisepsis of the participants' antecubital fossa. The extracted serum was conditioned for the biochemical measurement of triglycerides, total cholesterol and fractions (HDL – high density lipoprotein – and LDL – low density lipoprotein). Total cholesterol and fractions (HDL, LDL and VLDL) were measured by the COD/DBP

colorimetric enzymatic method, whilst triglycerides were measured by GPO/PAP (Labtest Diagnostica). Serum creatinine was assessed by traceable enzymatic method of dilution mass spectrometry with IDMS isotopes in automatic analyzer (Labmax 240 Premium).

Serum glycemia was analyzed by taking a sample of 4 ml of blood conditioned in a vacuum tube with 2 mg/ml of sodium fluoride, centrifuged prior to analysis. The serum glycemia was measured by the glucose oxidase method (Labtest Diagnostica).

Arterial hypertension was characterized as diastolic blood pressure (DBP) ≥ 90 mmHg and/ or systolic blood pressure (SBP) ≥ 140 mmHg and/ or current use of antihypertensive medication. The American Diabetes Association (ADA) criteria were employed for diabetes mellitus, such as fasting plasma glucose ≥ 126 mg/dl, and usage of oral hypoglycemic medicine or insulin. To diagnose metabolic syndrome, data were interpreted according to the I Brazilian Guideline for the Diagnosis and Treatment of Metabolic Syndrome, which complied fully the National Cholesterol Education Program's Adult Treatment Panel III. Criteria required the results of three or more of components: i) waist diameter > 102 cm for males and > 88 cm for females; (ii) triglycerides ≥ 150 mg/ dl; iii) HDL-cholesterol < 40 mg/dl for males and < 50 mg/dl for females; iv) SBP ≥ 130 mmHg, ≥ 85 mmHg, or use of antihypertensive medicines; and v) fasting glucose ≥ 110 mg/dl or use of hypoglycemic medicines[12].

Dependent variable in current research was provided by an answer to the question: "As a rule, would you say that your health is very good, good, fair, bad or very bad?" The extracts "bad" and "very bad" were employed for negative health self-assessment.

Independent variables included social and demographic factors, habits, self-perceived and evaluated health conditions. Life quality was provided by the WHO Health Quality Questionnaire, abridged edition WHOQOL-Bref (The World Health Organization Quality of Life Assessment)[13]. Physical, psychological, social and environmental score for life quality and total life quality were calculated in terciles.

Complex sample in current research requires the use of variance estimate between averages obtained by primary sampling units within each stage. Data analyses employed complex samples routine of Statistical Package for Social Sciences (SPSS) 20.0 for Windows.

Data were analyzed in a descriptive and exploratory mode to evaluate distribution and characterize the population under analysis. Quality variables were described by absolute and proportional numbers, whilst qualitative variables were assessed by mean and standard deviation. Pearson´s chi-square test was employed to analyze differences between category variables. Student´s t test evaluated continuous variables.

Bivariate analysis was employed to investigate the association of different variables and the study´s aim. Logistic regression models estimated the greatness of the association in odds ratio (OR), between the dependent variable, negative health self-assessment, and independent variables. The upper tercile was used as reference in life quality and indicated best life quality.

In the case of multiple analysis, variables with $p<0.20$ in raw analysis were included and the greatness of variables adjusted by other significant variables was assessed. Hierarchical model was employed featuring demographic, social and economic variables at the first level; habits and health conditions were placed at the second level; morbidities and disease-related factors came on the third level. Significant levels at one stage remained in the model in the following stages. Significance level was $\alpha = 0.05$. All analyses took into consideration results of sampling design and calibrated weights of observations. Results of observations were given by 'n' and results of calibrated weights for population extrapolation were given by 'expanded n (N)'.

Model study complied with CNS Resolution n. 466/2012 with regard to ethics in research on human beings and approved by the Committee for Ethics in Research (CEP) of the Universidade Federal do Acre, code number 17543013.0.0000.5010.

RESULTS

The prevalence of negative self-assessment reached 12.1%, whilst, in the other assessed categories, the prevalence of health self-assessment as fair reached 45.0% and positive self-assessment (very good and good) reached 42.9% among the 685 participating adults. Highest prevalence rates for negative self-assessment was reported in 40–59-year-old people, with a former or present smoking record ($p<0.005$). Schooling was peripheral in the analysis of difference among groups (Table 1).

Table 1. Prevalence of negative health self-assessment according to social and demographic characteristics and life habits in adults in Rio Branco AC Brazil, 2014

Variables	Total		Negative health self-assessment		p-rate[a]	OR_{raw} (IC 95%)
	N	n	N	%		
Age (years)					< 0,001	
18-39 years	146,447	376	11,598	7.9		1
40-59 years	65,455	309	13,988	21.4		3.16 (2.03-4.93)
Gender					0.530	
Male	101,133	212	11,301	11.2		
Female	110,769	473	14,285	12.9		
Civil status*					0.737	
With partner	94,979	316	10,883	11.5		
Without partner	115,800	365	14,493	12.5		
Ethnicity					0.684	
White	39,856	129	5,266	13.2		
Non-white	172,046	556	20,320	11.8		
Schooling*					0.051	
High school and tertiary education	95,832	292	9,529	9.9		1
Up to Year 9	112,246	379	15,756	14.0		1.48 (1.00-2.20)
Physical activities*					0.102	
Yes	70,513	180	6,367	9.0		1
No	140,210	502	19,219	13.7		1.60 (0.90-2.84)
Smoking*					0.012	
Non smoking	119,579	368	11,352	9.5		1
Smoker or former smoker	91,022	312	13,933	15.3		1.72 (1.13-2.63)
Alcohol abuse*					0.211	
No	177,019	594	21,699	12.3		
Yes	26,795	65	1,840	6.9		
Total	**211.902**	**685**	**25,586**	**12.1**		

Source: research data. * los of information; [a] Pearson´s chi-square; OR = odds ratio; N = expanded sample.

Negative prevalence was significantly higher ($p<0.005$) among people who use medicines, obese people, those who were always or nearly always feeling stressed, those classified with central obesity according to waist circumference (WC), hypertensive people, who suffered from insomnia or depression, those with a heart condition or with metabolic syndrome (Table 2).

Physical, psychological and environmental domains of life quality had lower means among people with negative health self-assessment when compared to those with positive self-assessment ($p<0.001$). There was no statistically significant difference for the environmental domain (Table 2).

Table 2. Prevalence of negative health self-assessment according to health, diseases and life quality domains in adults in Rio Branco AC Brazil, 2014

Variables	Total		Negative health assessment		p-rate[a]	OR_{raw} (IC 95%)
	N	n	N	%		
Usage of medicines					< 0.001	
No	148,550	435	10,129	6.8		1
Yes	63,352	250	15,457	24.4		4.41 (2.54-7.67)
BMI (kg/m²)*					0.013	
< 25	84,520	255	9,058	10.7		1
25-29.9	71,808	241	7,390	10.3		0.96 (0.51-1.79)
≥ 30	37,467	141	8,477	22.6		2.44 (1.22-4.88)
Central obesity (CC)*					0.002	
CC ≤ 102M or ≤ 88F	158,881	484	16,924	10.7		1
CC > 102M or > 88F	38,001	161	8,331	21.9		2.36 (1.38-4.03)
Stress*					0.020	
Never, sometimes	154,389	494	15,848	10.3		1
Always, almost Always	50,637	170	9,005	17.8		1.89 (1.11-3.23)
Hospitalization*					0.062	
No	176,454	560	19,021	10.8		1
Yes	25,120	97	4,518	18.0		1.82 (0.96-3.42)
Arterial hypertension*					0.001	
No	156,041	477	16,266	10.4		1
Yes	39,534	167	9,037	22.9		2.53 (1.46-4.45)
Diabetes*					0.631	
No	188,349	617	23,125	12.3		
Yes	10,372	34	1,534	14.8		
Insomnia*					< 0.001	
No	161,849	508	13,668	8.4		1
Yes	48,855	174	11,427	23.4		3.31 (2.00-5.49)
Depression					< 0.001	
No	192,251	611	19,343	10.1		1
Yes	18,293	70	5,451	29.8		3.79 (2.05-7.01)
Metabolic syndrome*					0.003	
No	171,05	540	18,635	10.9		
Yes	24,758	102	5,903	23.8		2.56 (1.39-4.70)
Life quality	**mean ± SD**		**mean ± SD**		**p-rate[b]**	
Physical	71.6 ± 0.77		56.6 ± 2.59		< 0.001	
Psychological	67.7 ± 0.72		56.7 ± 1.50		< 0.001	
Social	71.9 ± 0.66		66.9 ± 1.25		0.001	
Environmental	58.3 ± 0.79		57.8 ± 1.55		0.690	

Source: research data. * los of information; [a]Pearson´s chi-square test; [b]Student´s t test; OR = odds ratio; N = expanded sample. OR raw of quality assessed for the lower tercile of each domain.

In the multivariate analysis adjusted by hierarchical level, age at the distal level and stress at the intermediate level ($p < 0.05$) were statistically significant. The use of medication and the occurrence of insomnia and depression in model 3 (proximal model) were significant (Table 3).

Table 3. Hierarchic model of negative health self-assessment according to independent variables in adults in Rio Branco AC Brazil, 2014

Variables	OR_{Adjust} (IC 95%) Model 1	OR_{Adjust} (IC 95%) Model 2	OR_{Adjust} (IC 95%) Model 3
Age			
18-39	1		
40-59	3.18 (2.02-5.02)		
Schooling			
High school and Tertiary	1		
Up to Year 9	1.18 (0.78-1.78)		
Physical activity			
Yes	1		
No	1.08 (0.61-1.93)		
Smoking			
Non smoker	1		
Smoker or former smoker	1.50 (0.97-2.33)		
BMI (kg/m²)			
< 25		1	
25-29,9		0.78 (0.40-1.50)	
≥ 30		1.94 (0.91-4.12)	
Central obesity (CO)			
CC ≤ 102M or ≤ 88F		1	
CC >102M or > 88F		1.80 (0.99-3.24)	
Stress			
Never; sometimes		1	
Always; almost always		1.87 (1.04-3.38)	
Usage of medicines			
No			1
Yes			2.23 (1.19-4.20)
Diseases			
Arterial hypertension			1.32 (0.72-2.43)
Insomnia			2.33 (1.20-4.53)
Depression			2.03 (1.02-4.04)
Metabolic syndrome			1.75 (0.90-3.40)
Hospitalization during the last 12 months			
No			1
Yes			1.61 (0.87-2.96)

Source: research data. BMI = Body Mass Index; OR = odds ratio; IC = confidence interval. Model 1 – Distal variables, adjusted; Model 2 – Intermediary variables, adjusted between themselves and by variables of the significant variable block of model 1, except for central obesity (CC) run without BMI; Model 3 – proximal variables, adjusted between themselves and by significant variables of models 1 and 2.

When objective laboratory parameters, obtained through laboratory tests, were assessed, differences in averages were reported between those who negatively self-evaluated their health for total cholesterol and LDL cholesterol fraction. In the analysis by control of potentially confounding variables, people with LDL greater than or equal to 160mg/dl were almost three times more likely to negatively self-evaluate their health (Table 4).

Table 4. Laboratory parameters changed according to negative health self-assessment adjusted by potentially confounding variables in adults in Rio Branco AC Brazil, 2014

Laboratory parameters	Total	Negative health self-assessment	p-rate[a]	cuts	OR_{Adjust} (IC 95%)
	mean ± SD	mean ± SD			
Hemoglobin (g/dl)	13.6 ± 1.36	13.6 ± 0.11	0.741	≤ 12g/dl	-
Total cholesterol (mg/dl)	185 ± 1.89	202 ± 4.18	< 0.001	< 240mg/dl	1.00 (0.59-1.68)
Triglycerides (mg/dl)	142 ± 5.24	169 ± 15.6	0.063	< 150mg/dl	1.29 (0.66-2.53)
LDL (mg/dl)	110 ± 1.36	122 ± 4.03	0.004	< 160mg/dl	2.85 (1.24-6.54)
Glucose (mg/dl)	89 ± 1.67	92 ± 5.42	0.601	≤ 126mg/dl	-
Serum creatinine (mg/dl)	0.8 ± 0.35	0.8 ± 0.24	0.882	< 1.3mg/dl	-
Albuminuria (mg/g)	17 ± 2.50	21 ± 7.00	0.509	< 30mg/dl	-

Source: research data. [a] Student´s t test; OR = odds ratio; CI = confidence interval; Model adjusted by age, schooling, smoking and physical activities.

Negative self-assessment of health was associated with lower scores of physical and psychological domains of life quality. After adjusting for distal, intermediate and proximal independent variables, coupled to gender variable, the greatness of associations was eight times more likely to belong to the lower terciles of life quality in the physical domain, and seven times more chances in the psychological one, since individuals negatively self-evaluate their health (Table 5).

Table 5. Analysis of logistic regression of terciles in life quality domain (WHOQOL) with negative health self-assessment in adults in Rio Branco AC Brazil, 2014

Life quality domains	OR (IC 95%) (Model 1)*	OR (IC 95%) (Model 2)**
Physical		
Upper tercile	1	1
Intermediary tercile	6.25 (3.09-12.69)	6.23 (2.92-13.30)
Lower tercile	11.06 (3.77-32.45)	8.33 (2.43-28.50)
p trend	< 0.001	< 0.001
Psychological		
Upper tercile	1	1
Intermediary tercile	3.95 (2.17-7.20)	3.47 (1.81-6.67)
Lower tercile	8.96 (2.20-36.47)	7.01 (1.78-27.51)
p trend	< 0.001	0.002
Social		
Upper tercile	1	1
Intermediary tercile	1.28 (0.60-2.70)	1.19 (0.51-2.76)
Lower tercile	1.72 (066-4.46)	1.93 (0.66-5.62)
p trend	0.406	0.429
Environmental		
Upper tercile	1	1
Intermediary tercile	0.70 (0.40-1.22)	0.69 (0.40-1.21)
Lower tercile	0.86 (0.32-2.28)	0.85 (0.30-2.39)
p trend	0.399	0.371

Source: research data. OR = odds ratio; CI = confidence interval; * Model 1: adjusted by gender, age, schooling, smoking, physical activities, Body Mass Index, Stress; ** Model 2: adjusted by gender, age, schooling, smoking, physical activities, Body Mass Index, stress, usage of medicine, hospitalization during the last 12 months, depression, insomnia and arterial hypertension.

DISCUSSION

Even after adjustments, the prevalence of negative health self-assessment, composed of 'bad' and 'very bad' strata, was high among adults (12.1%). It was associated with age (40 to 59 years), stress, use of medicines and self-reported insomnia or depression. In the analysis of life quality, people who negatively self-evaluated their health were more likely to belong to the lower tercile of the physical and psychological domains, probably controlled by confounding variables.

When compared with other Brazilian studies, the prevalence of negative health self-assessment was much higher in current study. In fact, data from the 2013 National Household Sample Survey (PNAD) revealed a prevalence of 5.9% in Brazilian population, or rather, people aged 18 years and more, in all the states and in the Federal District[12]. Further, according to data from the Surveillance of Chronic Diseases by Telephone Survey (Vigitel) obtained in Brazilian capital cities and the Federal District in 2006, a previous study with 54,213 people aged 18 years or over showed that the prevalence in Brazil was 5.4%, whilst in Rio Branco it was 6.8%[15].

Prevalence remained high, even when rates were compared with studies by regions, as retrieved from data on 13,894 people living in the capital cities of northeastern Brazil (Aracaju, Fortaleza, João Pessoa, Maceió, Natal, Recife, Salvador, São Luís and

Teresina), in 2011, with a prevalence of 4.6% among males and 8.1% among females[6]. In the city of Maringá PR Brazil, prevalence among people aged 20 to 59 years was 8.7% between 2010 and 2011[16], whilst in Joaçaba SC Brazil, it reached 3.9%[17] among people of the same age group, or rather, much lower than data in current study.

Prevalence rates vary between studies. This is due to population and place, and to classification selected as negative self-rated health assessment, since some authors include the intermediate ('fair') category. Based on other studies, current investigation did not include this category because the authors hold that negative health self-assessment comprises statements that clearly demonstrate the choice of people to report their health as poor or very poor. In a study conducted in Maringá PR Brazil, the 'fair' category differed totally from the 'bad' category in the analysis of associations in the different strata. In fact, 'fair' has been associated only with arterial hypertension, whereas the 'bad' category was not associated with this morbidity, but with heart failure, stroke and acute myocardial infarction[16]. Another study also pointed out problems in the dichotomization of health self-assessment with inclusion of the 'fair' stratum within the negative evaluation[18]. It is worth noting that some studies that analyze factors associated with positive self-rated health fail to include the 'fair' stratum or evaluate it separately[6,17].

Current study has associated negative self-assessment of health with age. Aging results in greater effects on physical and mental health, since most diseases and limitations appear over time. A cohort study conducted in Albania for three consecutive years pinpointed age as an important factor for poor health self-assessment, regardless of gender[19]. In a study conducted in Maringá PR Brazil, negative health self-assessment increased almost eight-fold in people within the 50-59 years age group when compared to people in other age brackets[16].

A highlight in current study is the effect of psychic conditions on health self-assessment revealed by its association with stress, insomnia, depression and on the psychological domain of life quality. Currently, society has suffered from psychic problems. This fact may be partially explained by impacts related to active life[20].

In current analysis, negative health self-assessment of health has been associated with age. Aging results in a greater impact on physical and mental health, since most diseases and limitations appear over time. A cohort study conducted in Albania for three consecutive years pointed to age as an important factor for poor self-assessment of health, regardless of gender[19]. In a study conducted in Maringá PR Brazil, the possibility of negative health self-assessment increased almost eight-fold in people aged 50 to 59 years when compared to those in other age groups[16].

Current study highlights the effect of psychic conditions on health self-assessment through the association with stress, insomnia, depression and on the psychological domain of life quality. Society is actually undergoing several psychic problems, and this is explained, in part, by the pressures related to active life[20].

Stress has become a morbidity condition[21]. In a study conducted in China, negative health self-assessment was almost seven times higher in people with high stress levels[6], or rather, higher than rates in current research within the intermediate model. A review study on the effects of health stress makes a distinction between short-term stress, which is important for improving immuneprotection responses, and chronic stress, which suppresses protective immune responses and/or exacerbates pathological immune responses, resulting in increase in diseases such as cancer[22]. Thus, stress has a direct effect on health, such as the increase in fibrinogen, and an indirect one, especially on health behaviors[23].

Further, inadequate sleep is associated with the occurrence of morbidities and negative health self-assessment [24], corroborating results in current study. In a study with 377,160 people aged 18 years and over, representative of the population of the

United States, a positive association was detected between increasing categories of insufficient sleep and negative health self-assessment of health, controlled by potentially confounding variables[25]. The National Health Survey, conducted in Brazil in 2013 with 60,202 adults (≥ 18 years), reported a prevalence (14.9%) of sleep disorders, associated with morbidities, even after adjustment[26]. Insomnia with short sleep duration is related to physiological hyperexcitement, cardiometabolic morbidities, neurocognitive impairment and difficulties in treatment. Treating such a condition is a priority due to its harmful effect on health[27]. Another important factor of insomnia is its impact on psychological health, as underlined in a case-control study with 1,741 people (≥ 20 years), who associated depression, fatigue, anxiety and negative health self-assessment with insomnia[28].

Depression accounts for 4.3% of the world's morbidities and it is among the main causes of disability (11.0% of total years lived with disability, worldwide)[29]. Further, 8.1% of US adults (≥ 20 years) had depression between 2013 and 2016[30]. A study in Brazil revealed a 9.7% prevalence among adults with depression[31]. Current analysis showed an association between depression and negative health self-assessment, corroborated by another study [32].

Depression may directly stimulate the production of pro-inflammatory cytokines[33] with a bidirectional effect on cardiovascular and metabolic diseases[34], but it may deregulate the cellular immune response, feeding the sustained production of cytokines[35].

Self-assessment seems to be affected more by the physical component than by the mental one. Depending on age, psychosocial aspects reflect equivalently physical situations on negative health self-assessment[7]. This fact has been confirmed in current study, since psychological conditions were associated with negative health self-assessment and with objective health components such as the use of medicines and alteration in low-density lipoprotein cholesterol (LDL-c).

Diseases require the use of medicines, a factor associated with negative health self-assessment in current study. Research conducted in Australia with 10,641 and 8,841 people (≥ 18 years), respectively, in 1997 and 2007, revealed that the use of medicines was three times higher among people who negatively assessed their health when compared to those who evaluated it positively[36]. Further, in a study conducted in Italy in 2015, involving 20,814 people, there was an association between medication use and negative health self-assessment[37]. Such association demonstrates forecasts negative health self-assessment, since the use of medicines is the product of worsening health conditions. The influence of medicines on the perception of health due to adverse reactions should also be underscored[38].

Among biomarkers, LDL-c has been associated with negative self-assessment in current study, albeit not constant in all analyses[17]. A study with 18,770 individuals, conducted in Norway between 2000 and 2001, detected high density lipoprotein cholesterol (HDL-c) as associated with positive health self-assessment[39], corroborating present study, foregrounding the complements of both. LDL-c occurs with atherosclerotic cardiovascular disease, since this is the main carrier of cholesterol in the circulation towards peripheral tissues. Reduction of risks of cardiovascular disease is an important therapeutic target[10].

Current study shows that physical and psychological aspects of life quality have greatly impacted self-health assessment. In the first case, the possibility of people assessing it negatively was eight times higher, whilst in the second, it reached seven times higher. In an international study in Sweden with 1,475 individuals aged 40 to 84 years, between 2004 and 2008, an association was detected between quality of life and negative health self-assessment of health[8]. In a study in the state of Minas Gerais, Brazil, with 1,129 participants (adults and elderly people), an association between negative health assessment

and negative quality of life assessment was registered [40].

Our results should be interpreted within the context of their limitations. Current type of investigation does not allow the assessment of causality between independent variables and negative health self-assessment of health. Further, information on morbidities, such as insomnia and depression, has been considered as a self-reported item. However, clinical and laboratory measurements were taken into account for most diseases. It should also be underlined that the potential effect of reverse causality in behavioral and psychosocial variables implies that results should be analyzed with caution. The possible occurrence of selective survival bias common in cross-sectional studies must be underscored, due to the survival of healthy individuals for longer periods, whilst those with worse health conditions die earlier. This fact may underestimate current results.

Robust points in current study comprise the employment of a representative sample of adults, aged 18 to 59 years, from Rio Branco, Brazil, and the assessment of clinical and laboratory parameters important for objective health evaluation. Further, the association between negative health self-assessment and the domains of life quality evidenced the influence of physical and psychological conditions on population´s health.

CONCLUSION

The prevalence of negative health self-assessment reached 12.1% among adults in Rio Branco, Brazil, and it has been associated with age, stress, use of medicines and self-report on insomnia or depression. People who negatively self-evaluated their health probably belong to the lower tercile of the physical and psychological domains of life quality.

Results showed that, since health self-assessment reflected physical and psychological conditions, it may assess the participants´ entire health status, comprehensively representing their health status. Most factors in this study may be altered by improving the population's health through the effective treatment of morbidities, the adoption of healthy behaviors and the improvement of mental well-being. This produces a positive impact on the population's life quality. Studies investigating subjective and objective health conditions should be encouraged throughout the country, especially in distant places such as the Amazon region.

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