

Self-reported well-being and associated factors among industrial workers in Brazil: findings from a national survey

Bem-estar subjetivo e fatores associados em trabalhadores da indústria brasileira: resultados de uma pesquisa nacional

Bienestar subjetivo y factores asociados entre trabajadores de la industria brasileña: resultados de una investigación nacional

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doi: 10.1590/0102-311X00191215

Abstract

The purpose of this study was to estimate self-perception of well-being and associated factors among industrial workers in Brazil. A cross-sectional survey was carried out with a representative sample from 23 Brazilian states and the Federal District. Self-reported of well-being was investigated by questionnaire. Multinomial logistic regression was used in unadjusted and adjusted analyses. For 93% of the 47,477 industrial workers, the perception of well-being was positive. Those who had the highest chances of being in the category of best perception of well-being were: male workers (OR = 1.35; 95%CI: 1.28; 1.43); those aged under thirty years old (OR = 1.24; 95%CI: 1.12; 1.39); those from Southern Brazil (OR = 1.99; 95%CI: 1.83; 2.16); and people with a high income. The prevalence of positive well-being was high. Sociodemographic, behavioral and social support characteristics, as well as the characteristics related to self-report on health were associated with well-being.

Health Promotion; Workers; Mental Health

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Introduction

Despite the consensus that public health should not be evaluated solely on aspects related to illness, but also positive outcomes in health, the approach of most studies is primarily focused on diseases. However, there is a growing trend in research focused on topics related to positive indicators of health such as quality of life, well-being and happiness ^{1,2}.

Well-being is a complex and dynamic concept involving a series of factors that influence the perception of well-being. The identification of variables associated with well-being has barely been explored on account of the lack of consensus on the underlying concepts and available research tools ³. In the last decade, studies on this topic found a possible causal association between well-being indicators and positive of health ⁴. However, epidemiological surveys are scarce and centralized in high income countries.

Gender, age and socioeconomic indicators such as income and education are factors that should be considered in research on well-being since there are a number of studies showing that men ^{5,6}, young adults ⁷ and those with higher levels of education and income tend to have higher levels of happiness and life satisfaction ^{8,9}.

The understanding of factors associated with well-being is essential for the knowledge and advancement of the field, providing relevant information for economic, political and social planning in several areas. Particularly in the industrial field, such data may serve to support measures to promote workers' health. Thus, the aim of this study was to estimate the self-perception of well-being and its association with sociodemographic characteristic, behavior, social support and self-report of health among industrial workers in Brazil.

Methods

This research results from the cross-sectional survey *Lifestyle and Leisure habits of Industrial Workers*, undertaken by the Brazilian Social Services for Industry (SESI) in partnership with the Center for Research on Physical Activity and Health at the Santa Catarina Federal University (UFSC). The data collected was representative of workers from 23 Brazilian states and the Federal District. The data was collected in the period between 2004 and 2008.

For the sample size, calculation was carried out for each state and the Federal District separately. The following parameters and estimates were adopted: prevalence of sedentary leisure activity of 45%, sampling error of 3%, confidence level of 95% and the effect of sampling design set at 1.5. A sample size of 20% was added to account for possible losses and denials in the collection process.

The sum of the required samples for each federative unit in Brazil was 52,774 workers. A two-stage sample plan was adopted. In the first stage, a random selection of companies was used, considering the distribution of workers in large (≥ 500), medium (100 to 499) and small (20 to 99) firms. The second stage consisted of arranging (randomly) the number of workers, considering the size of each of the companies that had been chosen in the previous stage. In each geographic region, samples were drawn from 10 to 50% of each size industries, in accordance with the amount of existing industries and the number of workers needed for the sample. The study included industries from several Brazilian cities, so it was not limited to the capitals of the 23 Brazilian states and Federal District.

Information was collected through the use of a questionnaire for the population of industrial workers that had been validated previously ⁹. The full questionnaire can be accessed at this link: http://www.sesimt.com.br/arquivos/415_book_lazer_ativo_internet.pdf. Data collection was performed by research assistants trained via videoconference all over Brazil. The questionnaires were self-administrated in groups of between 3 and 15 workers under the supervision of the research assistants.

The self-perception of well-being was defined by the degree to which the individual person assessed life satisfaction in three contexts: home, work and leisure-time. For each context the following question was applied: "how do you feel, nowadays, regarding your life at... [home, work and leisure-time]?" For each question there were five response options: "very bad", "bad", "indifferent", "good", and "very good".

Then, a continuous ordinal scale was built with a range of between 3 and 15 points based on the following score for each response option for each context: (1) very bad; (2) bad; (3) indifferent; (4) good; (5) very good. In estimating the prevalence of well-being, the variable was dichotomized into negative and positive perception and those that scored 10 points or more were considered to have a positive perception. Subsequently, for the purpose of association analysis, the workers' perception of their well-being was distributed across four quartiles. The score was categorized into quartiles whereby the 1st quartile was defined as those with the worst perception the 2nd as low-intermediate perception the 3rd as high-intermediate perception and the 4th as the best perception of well-being.

The associated factors investigated were distributed into four blocks. The socio-demographic block included the variables; gender, age (< 30; 30-39; 40-49; ≥ 50), marital status (married/living with partner), geographical region of Brazil (North, Northeast, Central, Southeast and South), education (incomplete elementary school, complete elementary school, complete high school, complete higher education) and family income in BRL (≤ 600; 601-1,500; 1,501-3,000; > 3,000). The second block included the variable religion, considered in this research as social support and categorized as follows: workers without religion, non-practicing religion and practicing religion. The variables of behavior, smoking, excessive consumption of alcoholic beverages and leisure-time physical activity make up the third block and were categorized as listed in Table 1. Finally, the fourth block covers variables of self-reports of health: perception of health, stress, sleep quality and perception of sadness/depression.

The digitalization of the questionnaires was done by means of optical reading using the software Sphynx (Sphynx Software Solutions LLC, Brooklyn, USA).

All the participants reported verbal consent before conducting the study. The project was approved by the Ethics Research Committee on Human Beings at the UFSC (approval statements 306/05 and 099/07).

Statistical analysis

All the analyses were performed using the software Stata version 11.0 (StataCorp LP, College Station, USA). Descriptive analysis consisted of presenting the data using absolute and relative frequencies in addition to the respective 95% confidence interval (95%CI). For statistical inference, the ordinal logistic regression was initially used by means of the proportional odds model¹⁰. However, upon checking the model adjustments using the Brant test, it was found that the data had violated the parallel regression test. After observing that this assumption was not validated, the multinomial logistic regression model was used as an alternative. In all cases unadjusted and adjusted analyses were performed and the results were expressed in odds ratios (OR), together with the 95%CI, assuming as the reference category the 1st quartile of well-being (defined as the worst perception). In the unadjusted analysis, the Wald test for heterogeneity or linear trend was applied, adopting a significance level of 0.05 ($p < 0.05$).

In the adjusted analysis, the hierarchical model was comprised of five levels: (1) demographic variables (gender, age, marital status and geographic region); (2) socio-economic variables (family income and level of education); (3) social support variable (religion); (4) behavior variables (smoking, excessive consumption of alcohol beverages and leisure-time physical activity); and (5) self-reports of health (perception of health, stress, sleep quality and perception of sadness). For the selection of variables that remained in the regression model the backward process was used, and the variables that remained in the model had the p -value < 0.20.

Results

Of the 52,774 subjects eligible for the study, 47,886 workers (90.6%) from 2,775 industries responded to the survey. In the process of reading and checking the data, 409 questionnaires (0.9%) were excluded as there was no response to gender. Thus, the sample for the research was composed of 47,447 workers.

Table 1 presents the sociodemographic characteristics, behavior, social support and self-reports on health in the researched sample. It was observed that the biggest portion of workers were male

Table 1

Distribution of the sample by sociodemographic characteristics, social support, behavior and self-report of health among industrial workers in Brazil, 2004-2008.

Variable	n	% (95%CI)
Gender		
Female	14,316	30.1 (29.7; 30.6)
Male	33,161	69.9 (69.4; 70.3)
Age range (years)		
< 30	21,801	46.1 (45.7; 46.6)
30-39	14,639	40.0 (30.5; 31.4)
40-49	7,943	16.8 (16.5; 17.1)
≥ 50	2,902	6.1 (5.9; 6.4)
Marital status		
Single	20,694	43.7 (43.3; 44.1)
Married	26,664	56.3 (55.9; 56.7)
Geographical region		
North	11,640	24.5 (24.1; 25.0)
Northeast	14,535	30.6 (30.2; 31.0)
Central	8,150	17.2 (16.8; 17.5)
Southeast	6,004	12.6 (12.3; 12.9)
South	7,148	15.1 (14.7; 15.4)
Education level		
Incomplete elementary school	8,969	18.9 (18.6; 19.3)
Complete elementary school	7,425	15.7 (15.3; 16.0)
Complete high school	24,173	51.0 (50.6; 51.5)
Complete higher education	6,803	14.4 (14.0; 14.7)
Family income (BRL)		
≤ 600	15,069	32.1 (31.7; 32.5)
601-1,500	19,451	41.4 (41.0; 41.8)
1,501-3,000	8,216	17.5 (17.1; 17.8)
> 3,000	4,245	9.0 (8.8; 9.3)
Religion		
No	2,475	5.7 (5.5; 5.9)
Yes, non-practicing	21,230	48.9 (48.4; 49.4)
Yes, practicing	19,709	45.4 (44.9; 45.9)
Smoking		
Smoker	6,163	13.0 (12.7; 13.3)
Ex-smoker	7,275	15.4 (15.0; 15.7)
Non-smoker	33,890	71.6 (71.2; 72.0)
Excessive consumption of alcoholic beverages *		
Yes	15,601	32.9 (32.4; 33.3)
No	31,876	67.1 (66.7; 67.6)
Leisure-time physical activity		
No	21,392	45.4 (44.9; 45.8)
Yes	25,740	54.6 (54.2; 55.1)

(continues)

Table 1 (continued)

Variable	n	% (95%CI)
Self-reported health		
Negative	7,651	16.2 (15.8; 16.5)
Positive	39,727	83.8 (83.5; 84.2)
Sleep quality		
Negative	9,909	20.9 (20.6; 21.3)
Positive	37,395	79.1 (78.7; 79.4)
Self-reported stress		
Always/Almost always	6,533	13.8 (13.5; 14.1)
Rarely/Sometimes	40,788	86.2 (85.9; 86.5)
Self-reported sadness		
Always/Almost always	2,535	5.7 (5.4; 5.9)
Rarely/Sometimes	42,259	94.3 (94.1; 94.6)
Self-reported well-being (quartiles)		
1 st (worst)	15,778	33.5 (33.1; 33.9)
2 nd	12,993	27.6 (27.2; 30.0)
3 rd	8,150	17.3 (17.0; 17.6)
4 th (best)	10,172	21.6 (21.2; 22.0)

95%CI: 95% confidence interval.

* > 7 or > 14 units in a normal week (for women and men respectively) in the last 30 days or ≥ 5 units, on one single occasion.

(69.9%), aged under 30 (46.1%), married (56.3%) and living in the Northeast of Brazil (30.6%). Concerning the socioeconomic characteristics, it was found that more than half of the sample (51%) had completed high school and 41.4% had a monthly family income of between BRL 601 and BRL 1,500.

Regarding the variable of social support chosen for this research, the largest proportion of workers (48.9%) declared they were religious but non-practicing. In the behavioral characteristics, over half (71.6%) declared they were non-smokers, 67.1% do not drink alcohol excessively and 54.6% of the workers reported that they did physical leisure activities. In the investigation of self-reports on health, it was identified that the majority (83.8%) perceive their health positively, 86.2% say they rarely and/or never had stress in their lives, 79.1% evaluated their sleep quality positively and the majority (94.3%) did not consider themselves sad. The presence of positive perception of well-being in workers in Brazil reached 93% (95%CI: 92.6; 93.4), which represents 43,807 industrial workers. Table 2 presents the prevalence of well-being according to independent variables researched. The variables that showed the best perception of well-being were: male workers, aged under 30, living in the South and Southeast regions of Brazil, with complete higher education and an income above BRL 3,000, declared as practicing religious, non-smokers, do not consume excessive alcoholic beverages, do physical leisure activities, with positive perceptions of health and sleep quality and declared to have no stress and little sadness on a daily basis.

The results of unadjusted and adjusted analyses of the association between the categories of perception of well-being and the other variables of exposition can be observed in Table 3. To summarize, those with the greatest chance of being in the category of best perception of well-being compared to other participants were: male workers (OR = 1.35; 95%CI: 1.28; 1.43), aged under 30 (OR = 1.24; 95%CI: 1.12; 1.39), living in Southern Brazil (OR = 1.99; 95%CI: 1.83; 2.16), with an income above BRL 3,000 (OR = 1.59; 95%CI: 1.43; 1.78) declared as religious (OR = 2.84; 95%CI: 2.50; 3.22), non-smokers (OR = 1.28; 95%CI: 1.17; 1.39), physically active in leisure-time (OR = 2.67; 95%CI: 2.52; 2.83), with positive perceptions of health (OR = 3.28; 95%CI: 2.98; 3.61) and sleep quality (OR = 3.04; 95%CI: 2.80; 3.30) and low perception of stress (OR = 1.61; 95%CI: 1.46; 1.76) and sadness in life (OR = 2.53; 95%CI: 2.29; 2.80).

Table 2

Prevalence of well-being perceptions according sociodemographic characteristics, social support, behavior and self-report of health among industrial workers in Brazil, 2004-2008.

Variable	Worst perception		Low-intermediate perception		High-intermediate perception		Best perception	
	%	95%CI	%	95%CI	%	95%CI	%	95%CI
Gender								
Female	37.4	36.6; 38.2	25.2	24.4; 25.9	17.1	16.4; 17.7	20.4	19.7; 21.0
Male	31.8	31.3; 32.3	28.6	28.1; 29.1	17.4	17.0; 17.8	22.1	21.7; 22.6
Age range (years)								
< 30	32.7	32.0; 33.3	26.5	25.9; 27.0	17.7	17.1; 18.2	23.2	22.6; 23.7
30-39	33.7	32.9; 34.5	28.7	28.0; 29.4	17.2	16.6; 17.8	20.4	19.8; 21.1
40-49	34.9	33.9; 36.0	28.4	27.4; 29.4	16.9	16.1; 17.7	19.8	18.9; 20.7
≥ 50	34.7	32.9; 36.4	28.8	27.1; 30.4	16.4	15.1; 17.8	20.1	18.6; 21.6
Marital status								
Single	34.0	33.4; 34.7	26.7	26.1; 27.3	17.4	16.8; 17.9	21.9	21.3; 22.5
Married	33.1	32.5; 33.7	28.2	27.7; 28.8	17.3	16.8; 17.7	21.4	20.9; 21.9
Geographical region								
North	37.5	36.6; 38.4	29.2	28.4; 30.0	15.5	14.8; 16.1	17.8	17.1; 18.5
Northeast	33.8	33.0; 34.6	29.9	29.1; 30.6	15.6	15.0; 16.2	20.7	20.1; 21.4
Central	33.2	32.2; 34.2	26.1	25.1; 27.3	18.2	17.3; 19.0	22.6	21.7; 23.5
Southeast	31.7	30.5; 32.9	23.6	22.5; 24.7	19.4	18.4; 20.4	25.3	24.2; 26.4
South	28.3	27.2; 29.3	25.4	24.3; 26.3	21.0	20.0; 21.9	25.4	24.4; 26.4
Education level								
Incomplete elementary school	34.0	33.0; 35.0	30.7	29.7; 31.6	15.1	14.3; 15.8	20.3	14.5; 21.1
Complete elementary school	34.6	33.5; 35.7	28.5	27.4; 29.5	16.3	15.4; 17.1	20.7	19.7; 21.6
Complete high school	33.9	33.2; 34.5	26.6	26.0; 27.1	17.8	17.3; 18.3	21.7	21.2; 22.2
Complete higher education	30.4	29.3; 31.5	26.2	25.1; 27.2	19.5	18.5; 20.4	24.0	22.9; 25.0
Family Income (BRL)								
≤ 600	35.9	35.1; 36.6	28.0	27.3; 28.7	15.4	14.8; 16.0	20.7	20.1; 21.4
601-1,500	34.1	33.4; 34.7	28.3	27.6; 28.8	17.3	16.8; 17.9	20.4	19.8; 20.9
1,501-3,000	31.0	30.0; 31.9	26.7	25.7; 27.6	18.9	18.0; 19.7	23.5	22.6; 24.4
> 3,000	27.5	26.2; 28.9	25.7	24.3; 27.0	20.8	19.6; 22.0	26.0	24.7; 27.3
Religion								
No	44.1	42.1; 46.0	26.9	25.2; 28.7	13.9	12.5; 15.2	15.2	13.7; 16.6
Yes, non-practicing	37.4	36.8; 38.1	29.4	28.8; 30.1	15.7	15.2; 16.1	17.5	17.0; 18.0
Yes, practicing	28.5	27.9; 29.1	26.6	26.0; 27.2	18.8	18.3; 19.4	26.1	25.5; 26.7
Smoking								
Smoker	38.7	37.5; 40.0	28.6	27.5; 29.7	14.8	13.9; 15.7	17.9	16.9; 18.8
Ex-smoker	36.6	35.5; 37.7	27.7	26.7; 28.8	16.6	15.4; 17.1	19.4	18.5; 20.3
Non-smoker	31.8	31.4; 32.4	27.4	26.9; 27.9	18.0	17.6; 18.5	22.7	22.3; 23.2
Excessive consumption of alcoholic beverages								
Yes	34.4	33.7; 35.2	29.5	28.8; 30.2	16.4	15.8; 17.0	19.7	19.0; 20.3
No	33.1	32.5; 33.6	26.7	26.1; 27.1	17.8	17.3; 18.2	22.6	22.1; 23.0

(continues)

Table 2 (continued)

Variable	Worst perception		Low-intermediate perception		High-intermediate perception		Best perception	
	%	95%CI	%	95%CI	%	95%CI	%	95%CI
Leisure-time physical activity								
No	42.7	42.0; 43.3	26.6	26.0; 27.2	15.1	14.6; 15.6	15.6	15.1; 16.1
Yes	25.9	25.4; 26.4	28.5	27.9; 29.0	19.1	18.6; 19.6	26.5	26.0; 27.0
Self-reported health								
Negative	57.7	56.6; 58.8	22.3	21.4; 23.2	11.1	10.4; 11.8	8.9	8.2; 9.5
Positive	28.9	28.4; 29.3	28.6	28.2; 29.1	18.5	18.1; 18.9	24.0	23.6; 24.5
Sleep quality								
Negative	53.4	52.3; 54.4	23.8	23.0; 24.7	12.4	11.7; 13.0	10.4	9.8; 11.0
Positive	28.3	27.8; 28.7	28.6	28.1; 29.1	18.6	18.2; 19.0	24.6	24.1; 25.0
Self-reported stress								
Always/Almost always	48.5	47.3; 49.8	23.8	22.7; 24.8	13.9	13.1; 14.8	13.7	12.9; 14.6
Rarely/Sometimes	31.1	30.7; 31.6	28.2	27.8; 28.6	17.8	17.5; 18.2	22.8	22.4; 23.2
Self-reported sadness								
Always/Almost always	73.7	72.0; 75.4	14.7	13.3; 16.1	6.8	5.8; 7.8	4.8	3.9; 5.6
Rarely/Sometimes	31.7	31.3; 32.2	28.6	28.1; 29.0	17.5	17.2; 17.9	22.2	21.8; 22.6

95%CI: 95% confidence interval.

* Percentages in the lines equal 100%.

Table 3

Unadjusted and adjusted odds ratio (OR) for the worst perceptions of well-being versus low-intermediate, high-intermediate and best perceptions among industrial workers in Brazil, 2004, 2006-2008.

Variable	Low-intermediate perception		High-intermediate perception		Best perception	
	Unadjusted OR (95%CI)	Adjusted OR * (95%CI)	Unadjusted OR (95%CI)	Adjusted OR * (95% CI)	Unadjusted OR (95%CI)	Adjusted OR * (95%CI)
Gender						
Female	1.00	1.00	1.00	1.00	1.00	1.00
Male	1.33 (1.26; 1.40) **	1.34 (1.27; 1.42) **	1.20 (1.13; 1.27) **	1.26 (1.19; 1.34) **	1.28 (1.21; 1.35) **	1.35 (1.28; 1.43) **
Age range (years)						
< 30	0.97 (0.88; 1.07)	1.02 (0.93; 1.13)	1.14 (1.02; 1.28) ***	1.14 (1.01; 1.28) ***	1.22 (1.09; 1.36) ***	1.24 (1.12; 1.39) ***
30-39	1.03 (0.93; 1.13)	1.07 (0.96; 1.18)	1.08 (0.95; 1.21)	1.09 (0.96; 1.23)	1.04 (0.93; 1.17)	1.07 (0.96; 1.20)
40-49	0.98 (0.88; 1.09)	1.01 (0.90; 1.12)	1.02 (0.90; 1.16)	1.03 (0.90; 1.17)	0.98 (0.87; 1.10)	1.00 (0.88; 1.12)
≥ 50	1.00	1.00	1.00	1.00	1.00	1.00
Marital status						
Single	1.00	1.00	1.00	1.00	1.00	1.00
Married	1.09 (1.04; 1.14) **	1.04 (0.99; 1.08)	1.02 (0.97; 1.08)	0.99 (0.94; 1.05)	1.00 (0.95; 1.05)	0.98 (0.93; 1.03)

(continues)

Table 3 (continued)

Variable	Low-intermediate perception		High-intermediate perception		Best perception	
	Unadjusted OR (95%CI)	Adjusted OR * (95%CI)	Unadjusted OR (95%CI)	Adjusted OR * (95% CI)	Unadjusted OR (95%CI)	Adjusted OR * (95%CI)
Geographical region						
North	1.00	1.00	1.00	1.00	1.00	1.00
Northeast	1.14 (1.07; 1.21) **	1.15 (1.08; 1.23) **	1.12 (1.04; 1.21) **	1.14 (1.06; 1.23) **	1.29 (1.21; 1.39) **	1.34 (1.25; 1.44) **
Central	1.00 (0.94; 1.09)	1.02 (0.95-1.10)	1.33 (1.22; 1.45) **	1.35 (1.24; 1.46) **	1.44 (1.33; 1.55) **	1.45 (1.34; 1.57) **
Southeast	0.96 (0.88; 1.04)	0.98 (0.90; 1.06)	1.49 (1.36; 1.63) **	1.52 (1.38; 1.66) **	1.69 (1.55; 1.84) **	1.74 (1.59; 1.89) **
South	1.15 (1.07; 1.25) **	1.21 (1.12; 1.31) **	1.80 (1.65; 1.96) **	1.87 (1.71; 2.04) **	1.90 (1.75; 2.06) **	1.99 (1.83; 2.16) **
Education level						
Incomplete elementary school	1.00	1.00	1.00	1.00	1.00	1.00
Complete elementary school	0.91 (0.84; 0.98) ***	0.91 (0.84; 0.98) ***	1.06 (0.97; 1.17) ***	0.99 (0.90; 1.09) ***	1.00 (0.92; 1.09) ***	0.93 (0.85; 1.02)
Complete high school	0.87 (0.82; 0.92) **	0.85 (0.80; 0.91)	1.19 (1.10; 1.28)	1.06 (0.98; 1.15)	1.07 (1.00; 1.15)	0.96 (0.89; 1.04)
Complete higher education	0.96 (0.88; 1.04)	0.91 (0.82; 1.00)	1.45 (1.32; 1.59)	1.16 (1.03; 1.30)	1.32 (1.21; 1.44)	1.06 (0.95; 1.18)
Family Income (BRL)						
≤ 600	1.00	1.00	1.00	1.00	1.00	1.00
601-1,500	1.06 (1.00; 1.12) ***	1.09 (1.03; 1.15) ***	1.18 (1.11; 1.26) ***	1.12 (1.05; 1.20) ***	1.04 (0.98; 1.10) ***	1.00 (0.94; 1.07) ***
1,501-3,000	1.10 (1.03; 1.18)	1.17 (1.08; 1.26)	1.42 (1.31-1.54)	1.31 (1.20; 1.43)	1.31 (1.22; 1.41)	1.27 (1.17; 1.38)
> 3,000	1.19 (1.09; 1.31)	1.25 (1.12; 1.39)	1.76 (1.59-1.95)	1.62 (1.44; 1.82)	1.64 (1.49; 1.80)	1.59 (1.43; 1.78)
Religion						
No	1.00	1.00	1.00	1.00	1.00	1.00
Yes, non-practicing	1.29 (1.16; 1.42) **	1.34 (1.20; 1.48) **	1.33 (1.17-1.51) **	1.35 (1.18; 1.54) **	1.36 (1.20; 1.54) **	1.40 (1.23; 1.58) **
Yes, practicing	1.53 (1.38; 1.69) **	1.62 (1.46; 1.80) **	2.10 (1.85; 2.39) **	2.22 (1.94; 2.53) **	2.66 (2.35; 3.01) **	2.84 (2.50-3.22) **
Smoking						
Smoker	1.00	1.00	1.00	1.00	1.00	1.00
Ex-smoker	1.03 (0.94; 1.12)	0.97 (0.88; 1.06)	1.16 (1.05; 1.29) **	1.02 (0.91; 1.14)	1.15 (1.04; 1.27) **	0.97 (0.87; 1.08)
Non-smoker	1.16 (1.09; 1.25) **	1.16 (1.08; 1.25) **	1.48 (1.36; 1.61) **	1.28 (1.16; 1.40) **	1.55 (1.43; 1.67) **	1.28 (1.17; 1.39) **
Excessive consumption of alcoholic beverages						
Yes	1.00	1.00	1.00	1.00	1.00	1.00
No	0.94 (0.90; 0.99) **	0.92 (0.87; 0.97) **	1.13 (1.06; 1.19) **	1.08 (1.01; 1.15) **	1.19 (1.13; 1.26) **	1.11 (1.04; 1.18) **

(continues)

Table 3 (continued)

Variable	Low-intermediate perception		High-intermediate perception		Best perception	
	Unadjusted OR (95%CI)	Adjusted OR * (95%CI)	Unadjusted OR (95%CI)	Adjusted OR * (95% CI)	Unadjusted OR (95%CI)	Adjusted OR * (95%CI)
Leisure-time physical activity						
No	1.00	1.00	1.00	1.00	1.00	1.00
Yes	1.76 (1.68; 1.85) **	1.73 (1.64; 1.82) **	2.08 (1.97; 2.20) **	2.00 (1.88-2.12) **	2.79 (2.65; 2.94) **	2.67 (2.52; 2.83) **
Self-reported health						
Negative	1.00	1.00	1.00	1.00	1.00	1.00
Positive	2.57 (2.41; 2.73) **	2.02 (1.88; 2.16) **	3.33 (3.07; 3.61) **	2.22 (2.03-2.43) **	5.41 (4.97; 5.90) **	3.28 (2.98; 3.61) **
Sleep quality						
Negative	1.00	1.00	1.00	1.00	1.00	1.00
Positive	2.27 (2.15; 2.40) **	1.71 (1.60; 1.81) **	2.84 (2.65; 3.05) **	2.08 (1.92-2.24) **	4.44 (4.13; 4.78) **	3.04 (2.80; 3.30) **
Self-reported stress						
Always/Almost always	1.00	1.00	1.00	1.00	1.00	1.00
Rarely/Sometimes	1.85 (1.73; 1.97) **	1.34 (1.24; 1.44) **	1.99 (1.84; 2.16) **	1,38 (1.26-1.51) **	2.59 (2.39; 2.80) **	1.61 (1.46; 1.76) **
Self-reported sadness						
Always/Almost always	1.00	1.00	1.00	1.00	1.00	1.00
Rarely/Sometimes	2.12 (2.00; 2.25) **	1.81 (1.70; 1.92) **	2.45 (2.26; 2.65) **	2.06 (1.89-2.25) **	3.29 (3.00; 3.61) **	2.53 (2.29; 2.80) **

95%CI: 95% confidence interval.

* Adjusted for gender, age range, marital status and geographical region (1st hierarchical level), education and income (2nd hierarchical level), number of people per household, and religion (3rd hierarchical level), smoking, consumption of alcoholic beverages and doing physical leisure activities (4th hierarchical level), and self-reported health, stress, sleep quality and sadness (5th hierarchical level);

** Wald test for heterogeneity, $p < 0,05$;

*** Wald test for linear tendency, $p < 0,05$.

Note: worst perception of wellbeing – reference category.

Discussion

This research has been a pioneer in the investigation of well-being in a representative sample of workers in Brazil. The shortage of research on well-being of the Brazilian population, the originality of the information, the high rate response (90.6%) and the analyses used – which allowed the observation of the magnitudes of the association effect with the evolution of perception of well-being – are to be considered strengths in our study.

Another relevant aspect is the range of the sample, which accurately represents the industrial workers from 24 out of the 27 federal divisions in Brazil. Finally, it was possible to carry out analysis using adjusted models for the socio-demographic, social support and worker lifestyle variables, allowing for more precise estimates of the associations. On the other hand, a cross-sectional study such as this one should recognize the limitation of not being able to prove a causal relationship between the perception of well-being and many of the characteristics analyzed, mainly because of the difficulty in establishing temporality. Another limitation is the period of data collection because well-being is a factor that can be influenced by features that change over the time.

Furthermore, an important limitation that should be recognized in our study is the fact that statistical analysis by conglomerates was not performed. At the time of the survey information was not included in the questionnaire or database about these strata. The lack of such information prevents the analysis of a complex sample considering the sampling plan defined initially in two stages

(company size and workers). This failure may have resulted in a lack of precision in the estimates presented. However, these issues did not limit the possibility of observing significant results, especially in the relationship between perception of well-being and socio-demographic and behavioral factors in a representative sample of workers in Brazil.

The majority of workers (93%) had a positive perception of well-being. A similar result was found in research done with a representative sample of adults in the United States. In assessing life satisfaction through measuring one item, the research revealed that 94.4% of Americans were satisfied with life ⁵. However, the prevalence of positive well-being found in Brazilian workers was higher than other research carried out in Australia (70.4%) ⁷ and in Thailand (70%) ⁸. One aspect that deserves attention is the difficulty of interpretation and comparison of the findings, on account of the complexity of the concept and the lack of consensus regarding the definition of well-being. In addition, the lack of standardization for tools and the disagreement on the best way to measure well-being are other factors that make it difficult to compare the data.

This study confirmed results from previous research suggesting an association between well-being and demographic characteristics, marital status aside. Factors such as gender, age, race and marital status have been frequently associated with well-being. However, the literature ^{5,10} has shown inconsistent results when it comes to the direction of the associations between well-being and the variables of gender and age. Looking at gender, male workers showed better perception of well-being, corroborating the results found by Strine et al. ⁵ in a survey conducted in 50 American states, where higher life satisfaction was found in men. However, a survey of mental health and well-being, conducted with 10,641 Australian adults, showed higher levels of well-being in women ⁷. Worse perception of well-being in women in comparison to men can be explained by sociocultural aspects. The double workload and the responsibility for children can bring challenges in terms of a balance between professional life and well-being, which may contribute to a worse perception of well-being. Also, regarding the labor market, several indicators show that women are at a lower level than men ¹¹, because men traditionally enter in the market sooner, receive better pay and have greater job stability. These reasons clarify some gender inequalities and may reflect life expectations, thus effecting the perception of well-being.

Regarding age, the results of this research are similar to those found by Dear et al. ⁷, but different from those found by Yiengprugsawan et al. ⁸, which revealed a positive association between life satisfaction and age, when a cohort of 87,134 Thai adults was studied. The fact that younger workers are more satisfied with life may be explained by several factors such as reduced vulnerability to adverse life situations (widowhood, divorce, frustrations), higher self-confidence, higher expectations about their future and career, and less responsibility in terms of family in comparison to older people.

Regarding Brazilian regions, a better perception of well-being was observed in the South and Southeast. The disparities in income distribution, industrial development, social and urban and work conditions ¹¹ among other reasons, can justify the differences found, confirming the potential of well-being in reflecting inequalities in different life contexts.

The socioeconomic factors, observed on an individual level in this research, are consistent with the evidence found in the academic literature. A direct association was observed between family income and education with regard to the perception of well-being. The results are similar to those in research carried out in Germany ¹², Croatia ¹³ and the United States ¹⁴, which identified higher levels of life satisfaction in groups with higher income and better education. There are many reasons to explain the differences in the pattern of well-being among workers of different income levels. Higher income enables more consumption power, which provides the purchasing of goods, living pleasant leisure experiences, access to health care plans and services, better insurance and security ¹². Having a higher level of education can represent better working and employment conditions causing an impact on income and life patterns ¹⁵.

Workers who declared they were religious, whether practicing or not, had better perception of well-being compared to non-religious workers. Results were consistent across a series of studies suggesting a positive association between religion and subjective well-being in a construction that includes happiness, life satisfaction, love of life and physical and mental health ^{16,17,18}. A possible hypothesis for this association is that religion becomes integrated in community and social activities, offering a secure and familiar environment with social support, as well as strengthening the feeling

of inclusion which encourages positive choices and provides a purpose in life thereby promoting well-being¹⁹.

In the analyses of behavioral variables, workers who were non-smokers, did not drink excessive alcoholic beverages and did physical leisure activities were found to have the best perception of well-being. When three categories for smoking were analyzed in research among 6,923 English adults, ex-smokers with over a year without smoking were shown to have higher levels of happiness compared to smokers, and similar levels to those who had never smoked²⁰. Effects of chronic use of nicotine on anxiety and depression can be reasons why workers that smoke reported worse perceptions of well-being. This explanation is due to the nicotinic acetylcholine receptors²¹. Studies suggest that they may modulate the pathways involved in the response to stress causing changes in the level of anxiety and mood of smokers.

For the consumption of alcoholic beverages the results are contradictory. Research carried out by Murphy et al.²², analyzed the impact of the use of alcohol and related problems in several life satisfaction domains in a sample of university students. The research pointed out that the excessive use of alcohol was associated with lower rates of well-being. However, Dear et al.⁷, in a comprehensive survey undertaken in Australia, revealed associations between a higher rate of life satisfaction and consumption of small or moderate amounts of alcohol (whilst non-drinking or drinking too much were associated with lower rates of satisfaction). Some of the rationale to explain such contradictory results is based on the fact that moderate alcohol consumption can stimulate interpersonal relationships. On the other hand, excessive consumption of alcoholic beverages is associated with higher stress and depression rates, thereby affecting the perception of well-being²³.

The possibility of association between being physically active and more satisfied with life found in this research is similar to that found in research conducted in the Netherlands²⁴ and Switzerland²⁵. In the work of Argyle²⁶, the author explains that exercising increases happiness either by liberating endorphins or because of the social outcomes obtained in group activities such as sports.

Amongst the facts researched, self-reports on health were the variables with the most magnitude in terms of effect on well-being. Results confirmed previous research which pointed out that mental health aspects, such as stress and symptoms of depression, as well as negative perceptions of health and sleep quality are inversely related to positive well-being^{2,5}.

A possible hypothesis for these associations can be attributed to biological factors. Positive emotional states such as low levels of stress and depression symptoms, as well as absence of sleeping disorders can unleash a series of factors, such as the balance of cortisol levels and in the circadian cycle, contributing to a positive perception of well-being.

In summary, the prevalence of positive well-being was high in workers in Brazilian industry, but important differences among the individuals with distinct characteristics were detected. Given the singularities of this research, it is expected that its dissemination may stimulate new research on well-being. Since the issue is a complex one involving economic, cultural and behavioral factors, it deserves to be approached more deeply, particularly given its importance in supporting and planning of public policies.

Given that changes in well-being levels serve as an indicator of progress and can be used to measure the success of public policies in different segments of the population, the evaluation of the well-being of the Brazilian population through cross-sectional and longitudinal studies is important. Furthermore, positive and preventive health behaviors should be managed and administered by the government, as well as by non-governmental organizations such as the SESI. Based on the results of preliminary studies, SESI developed health promotion policies and interventions that focused on promoting more active lifestyles and healthier lives. Therefore, results such as this study can provide support and encourage the industry and the Brazilian government to invest in increasing the perception of well-being among its workers. Intervention strategies should be directed at groups with lower prevalence of positive well-being, particularly women, older individuals with lower income and education levels, and those who adopt risky behaviors and have negative health perceptions.

Contributors

S. G. Silva performed the data analysis and writing of the article. G. F. Del Duca took part in the final drafting and critical review of the article. M. V. Nahas was responsible for coordinating field work and participated in the final drafting and critical review of the article.

Acknowledgments

Shana Ginar da Silva, Giovani Firpo Del Duca and Markus Vinicius Nahas wish to thank the Brazilian Nacional Research Council (CNPq) for their scholarships and the Brazilian Social Services for Industry (SESI). The survey received logistical and financial support from the SESI.

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Resumo

O objetivo do estudo foi estimar o bem-estar subjetivo e fatores associados em trabalhadores da indústria brasileira. Foi realizado um inquérito transversal em uma amostra representativa de 23 Estados brasileiros e Distrito Federal. O estudo usou um questionário para investigar o bem-estar relatado pelo próprio trabalhador como variável-desfecho. Foi utilizada regressão logística multivariada nas análises bruta e ajustada. Do total de 47.477 trabalhadores, 93% tiveram uma percepção positiva do seu próprio bem-estar. O bem-estar subjetivo esteve associado aos seguintes fatores: gênero masculino (OR = 1,35; IC95%: 1,28; 1,43); idade abaixo de 30 anos (OR = 1,24; IC95%: 1,12; 1,39); Região Sul (OR = 1,99; IC95%: 1,83; 2,16) e renda mais alta. A percepção de bem-estar positivo foi alta entre trabalhadores da indústria brasileira. Fatores sociodemográficos, comportamentais, de suporte social e de autorrelato de questões de saúde mostraram associação com o bem-estar subjetivo.

Promoção da Saúde; Trabalhadores;
Saúde Mental

Resumen

El objetivo del estudio fue estimar el bienestar subjetivo y factores asociados entre trabajadores de la industria brasileña. Se realizó una encuesta transversal en una muestra representativa de los 23 estados brasileños y Distrito Federal. El estudio usó un cuestionario para investigar el bienestar informado por el propio trabajador como variable-desenlace. Se utilizó la regresión logística multivariada en los análisis brutos y ajustados. De un total de 47.477 trabajadores, un 93% tuvieron una percepción positiva de su propio bienestar. El bienestar subjetivo estuvo asociado a los siguientes factores: género masculino (OR = 1,35; IC95%: 1,28; 1,43); edad por debajo de los 30 años (OR = 1,24; IC95%: 1,12; 1,39); región sur (OR = 1,99; IC95%: 1,83; 2,16) y renta más alta. Había una alta prevalencia de bienestar positivo. Los factores sociodemográficos, comportamentales, de apoyo social y de autoinforme de cuestiones de salud mostraron una asociación con el bienestar subjetivo.

Promoción de la Salud; Trabajadores;
Salud Mental

Submitted on 24/Nov/2015
Final version resubmitted on 19/Apr/2016
Approved on 02/May/2016