Informal work, unemployment and health in Brazilian metropolitan areas, 1998 and 2003

Trabalho sem proteção social, desemprego e saúde em regiões metropolitanas brasileiras, 1998 e 2003

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Abstract

This study investigates whether employment with no social security, as well as short and long term unemployment are associated with worse health among Brazilians. The representative study sample was taken from two National Health Surveys and included men aged between 15 and 64 who lived in one of the eight metropolitan regions of Brazil in 1998 (n = 31,870) and 2003 (n = 32,887). Both surveys showed that full and part time workers with no social security, as well as those in short and long term (≥ 12 months) unemployment had worse health indicators, regardless of age or schooling, when compared with full-time workers (≥ 40 hours/week) who had some form of social security through their employment. Hepatic cirrhosis was the disease most strongly associated with labor market status. Its prevalence was higher among individuals in long term unemployment and those with no social security. Labor market status was also negatively associated with the use of health care services, especially medical visits. The present study shows that the absence of social security at work, unemployment and length of unemployment, characterize heterogeneous groups of individuals in relation to health. Results reinforce the need to incorporate labor market status in research into health inequalities.

Unemployment; Health Insurance; Health Inequalities

Introduction

Work is one of the most important determinants of people's way of life, strongly influencing their health and longevity [1]. Flexibility in the labor market is one of the most significant changes to impact on social and economic conditions around the world [2], particularly in developing countries. To a large extent, the typical salaried job that is a guarantor of stability and of the rights of the employee has been replaced by temporary and part-time employment, and by other, precarious forms of employment including jobs with no contract and self employment [3]. Workers with precarious employment are more likely to suffer from adverse socioeconomic conditions and to be exposed to worse environments and working conditions. Their risk of unemployment is also greater [4].

Little is known about the impact of precarious employment on health and investigations of this theme represent a challenge to researchers [4]. Studies carried out in countries such as England and Finland have placed a priority on the relationship between perceived work insecurity and health, and have identified associations with greater morbidity and worse mental health [5,6]. There are limitations with such an approach since the perception of instability may equally affect the health of individuals whether their working conditions are objectively safe or unsafe [7]. Other studies have addressed the

relationship between health and labor market status. In a Finnish cohort, precarious links between work and unemployment presented higher risk of death from diseases related to alcohol and from smoking-related neoplasia [8].

The situation of access to work and employment related social guarantees in Brazil is both diverse and excluding. Since the 1980s, a progressive breakdown of the labor market structure has occurred [9]. An important factor in this process is the increase in the number of jobs that are not state regulated or do not guarantee access to the social protection system, including unregistered jobs and those who are self-employed or work in cooperatives [10]. In 1989 registered, salaried workers represented 64% of the economically active population. In 1995, this figure had dropped to 58.2%. During this period, unregistered employment increased at a rate of 3.12% a year, generating about 541,500 unregistered jobs [11]. Between 1992 and 2002, the unemployment rate rose from 7.2% to 9.9% in Brazil as a whole, and from 9.7% to 13.5% in the country's metropolitan regions. In these metropolitan regions, unregistered employment and self employment increased by a greater margin than in the rest of the country [12].

In the present study, we consider social protection at work and weekly hours of work to be two distinct categories that define labor market status. The principal study hypothesis is that unprotected work, unemployment and length of unemployment are associated with worse health status. Our main objective is to verify this by testing associations between labor market status and indicators for health and healthcare in two recent years.

Methods

Study population

The present study includes men aged between 15 and 64 who live in Brazilian metropolitan regions and were included in the economically active population among participants of the 1998 and 2003 National Household Surveys, carried out by Brazilian Institute for Geography and Statistics (IBGE). The surveys are based on complex probabilistic samples described elsewhere [13] and contain data on socio-demographic factors and health and healthcare use. The information was obtained through interviews, though these were not always given by the individual subject.

Study variables

In this study, response variables were health and healthcare use indicators. The health indicators were: report of low back pain, tendonitis, hypertension, arthritis/rheumatism, cancer, diabetes, bronchitis/asthma, heart disease, chronic kidney disease, depression, cirrhosis and chronic disease, the latter referring to the reporting of at least one of the nine conditions listed above. Healthcare use indicators were: medical visit and hospitalization in the past 12 months.

The explanatory variable that is of most interest to this study was labor market status, classified in six groups: full-time (≥ 40 hours/week) employment with social protection; part time (< 40 hours/week) employment with social protection; full time unprotected employment (informed work); part-time unprotected employment (informed work); short term (< 12 months) and long term (≥ 12 months) unemployment. Employment with social protection includes those jobs with a signed working agreement and/or social protection cover. Unprotected employment refers to situations where the employee is not registered or receives no social benefits. Unemployment corresponds to the condition in which the individuals were not working and were seeking a job in the reference week.

Other socio-demographic characteristics included were age, schooling, head of household, income from the main job and from all jobs held during the year, expressed as a multiple of the monthly Brazilian minimum wages (MW) and self-reported color (white, mixed-race/black, indigenous and yellow). Individuals who declared themselves mixed-race or black were grouped as they have similar characteristics in relation to positions in the labor market. Private health plan was considered as an intermediate variable between labor market status and healthcare utilization.

Data analysis

The association between labor market status and socio-demographic characteristics was measured using Pearson's chi-square test with a 5% significance level. This test was also used to compare labor market status according to socio-demographic characteristics between the two years. Differences between the median income from the main job and from all jobs held during the year for each year and between the two years were tested using a chi-square test for median comparison. Because the prevalence of the conditions being studied were quite low [14] (for

instance, 0.25% for cirrhosis in 1998 and 0.16% in 2003; 3.2% for depression in 1998 and 2.3% in 2003), multiple regressions were used to investigate the independent associations between each response variable of interest and labor market status, adjusting for age and schooling. The reference category for analysis was full-time employment with social protection. When the response variable was healthcare use, chronic disease was also used as an adjusted variable. In order to compare the results, prevalence ratios were also calculated using Poisson regression. There were no difference regarding the associations seen, and only very minor ones in the magnitude and confidence intervals of odds ratios and prevalence ratios. For this reason and because the main objective of the study was to investigate the associations rather than to estimate the magnitude, we present the results by means of the odds ratio.

Data were analyzed using Stata version 9.0 (Stata Corp., College Station, U.S.A.) for complex sample surveys. Normalized weights were used to correct different probabilities of individual selection, without sample expansion. The percentages shown are weighted. Sampling design effects on variance estimates were also considered. To do so, strata presenting only one primary sampling unit were paired using similar strata sizes in the same metropolitan region [15].

The present study uses data from two national surveys and was analyzed in accordance with the principles of the *Helsinki Declaration*.

Results

A total of 31,870 men from the economically active population participated in the study in 1998 and 32,887 in 2003. Between these two periods, the proportion of full-time workers with social protection fell from 53% to 50.7%; the proportion of part-time unprotected employees increased from 6.5% to 7.5% and long term unemployment rose from 5.7% to 6.5%. These changes were all statistically significant. Full-time unprotected employment increased from 23.9% to 25.1% and part-time employment with social protection dropped from 5.5% to 5%, while short term unemployment remained more or less stable at about 5.3%, but these variations were not statistically significant (Table 1).

In both periods, the young represented a larger proportion of those who were in some form of unemployment, especially in long term unemployment, and in part-time unprotected employment. In 2003, there was an increase in the percentage of unemployed individuals who were aged 45 or more. Full and part-time workers with social protection include a higher proportion of individuals with ≥ 15 years of schooling in both years. Compared to 1998, the percentage of individuals with 11+ years of schooling increased in 2003 among all labor categories and the unemployed. There was no change in the distribution of heads of household according to labor market status in the two years analyzed. The percentage of men who declared themselves as black or mixed race increased in all studied groups in 2003. Monthly incomes were also greater amongst those who received social protection at work. In 2003 the mean income fell across all working categories (Table 2).

Table 3 presents the associations between labor market status and health indicators. In 1998, socially protected part-time employees had a greater probability of reporting tendonitis, arthritis/rheumatism, cirrhosis and depression. None of these associations were found in 2003. In 1998, full-time unprotected employment was positively associated with depression and

Table 1

Labor market status of Brazilian men living in metropolitan regions, 1998 and 2003.

	1998 (n = 31,870)		2003 (n = 32,887)	
	%	95%CI	%	95%CI
Full-time employment with social protection	53.0	52.0-54.0	50.7	50.0-51.5
Part-time employment with social protection	5.5	5.1-6.0	5.0	4.7-5.3
Full-time employment unprotected	23.9	23.1-24.8	25.1	24.4-25.7
Part-time employment unprotected	6.5	6.1-6.9	7.5	7.1-7.8
Short term unemployment	5.3	4.9-5.7	5.3	4.9-5.6
Long term unemployment	5.7	5.4-6.0	6.5	6.1-6.8

Table 2

Distribution of sociodemografic characteristics by labor market status in Brazilian males residing in metropolitan region, 1998 and 2003 (percentages).

	1998 (p < 0,00001) *					
	Employment with social protection		Employment with no social protection		Unemployment	
	Full-time (n = 16,202)	Part-time (n = 1,855)	Full-time (n = 7,962)	Part-time (n = 2,400)	Short term (n = 1,739)	Long term (n = 1,712)
Age (years)						
15-24	18,7	20,6	26,2	37,5	39,9	58,9
25-34	29,7	28,7	25,8	20,8	27,4	16,3
35-44	28,6	27,0	24,4	17,1	19,2	11,1
45-54	17,0	16,2	15,5	13,9	10,6	9,5
55-64	6,0	7,5	8,2	10,8	3,0	4,2
Median	35 (27-44)	35(26-44)	34 (24-44)	30 (20-44)	28 (21-38)	22 (18-34)
Schooling (years)						
0-3	11,7	6,1	22,3	19,1	16,0	14,0
3-7	28,0	16,8	39,3	34,6	39,3	35,6
8-10	21,9	20,2	18,7	20,5	25,1	30,6
11-14	26,4	33,4	15,2	18,1	17,7	17,1
≥ 15	12,0	23,5	4,5	7,7	1,9	2,6
Median	9 (6-12)	12 (9-15)	7 (5-10)	8 (5-12)	8 (5-11)	9(6-11)
Household head						
Yes	68,2	61,8	61,0	48,5	42,9	21,5
No	31,8	38,2	39,0	51,5	57,1	78,5
Color						
White	62,8	68,4	53,5	55,0	50,9	53,0
Brown/Black	36,0	30,3	45,3	43,7	48,2	46,5
Indigenous	0,1	0,1	0,1	0,2	0,2	0,3
Yellow	1,1	1,2	1,1	1,1	0,7	0,3
Income						
Main job	4,0 (2,4-7,7)	4,6 (2,3-8,5)	2,7 (1,5-4,6)	1,5 (0,6-3,1)	-	-
All jobs	4,1 (2,5-7,7)	4,6 (2,6-10,0)	2,7 (1,5-4,6)	1,5 (0,6-3,5)	-	-
	2003 (p < 0,00001) *					
	Employment with social protection		Employment with no social protection		Unemployment	
	Full-time (n = 15,911)	Part-time (n = 1,748)	Full-time (n = 8,495)	Part-time (n = 2,858)	Short term (n = 1,763)	Long term (n = 2,133)
Age (years)						
15-24	18,1	19,0	23,8	35,9	35,0	58,4
25-34	29,9	25,7	25,1	19,9	29,3	16,2
35-44	27,5	27,5	24,1	18,0	19,5	10,7
45-54	18,3	19,1	18,1	14,7	12,0	9,8
55-64	6,2	8,7	9,1	11,6	4,1	4,9
Median	35 (27-44)	36 (27-46)	35 (25-45)	31 (21-45)	29 (22-40)	22 (18-35)
Schooling (years)						
0-3	8,1	6,2	18,8	17,1	13,5 *	10,6
3-7	21,7	13,7	33,3	28,5	31,3	24,9
8-10	20,1	16,3	22,0	24,0	26,1	32,5
11-14	36,6	40,6	21,3	23,4	25,1	28,6
≥ 15	13,5	23,2	4,6	7,0	4,1	3,4
Median	12 (7-12)	12 (9-15)	8 (5-12)	9 (5-12)	9 (6-12)	9 (7-12)
Household head						
Yes	67,8	64,9	62,5	49,1	48,0	22,5
No	32,2	35,1	37,5	50,9	52,0	77,5
Color						
White	61,1	63,5	52,1	51,8	46,7	48,0
Brown/Black	37,9	35,4	46,9	46,9	52,4	51,5

(continue)

Table 2 (continued)

	2003 (p < 0,00001) *					
	Employment with social protection		Employment with no social protection		Unemployment	
	Full-time (n = 15,911)	Part-time (n = 1,748)	Full-time (n = 8,495)	Part-time (n = 2,858)	Short term (n = 1,763)	Long term (n = 2,133)
Indigenous	1,7	1,5	0,3	2,8	0,4	0,2
Yellow	0,9	1,0	0,8	1,0	0,5	0,4
Income						
Main job	2,7 (1,7-5,0)	2,9 (1,7-5,4)	1,7 (1,0-2,9)	1,0 (0,4-1,9)	-	-
All jobs	2,7 (1,7-5,0)	3,2 (1,8-6,3)	1,7 (1,0-2,9)	1,0 (0,4-2,1)	-	-

Note: p value (Pearson chi-square test for difference between 1998 and 2003) – age (p < 0,00001); schooling (p < 0,00001); household head (p = 0,6723); color (p < 0,00001); income (p < 0,0001).

* Pearson chi-square test for difference sociodemografic characteristics distribution by labor market status.

Table 3

Odds ratio (OR) and 95% confidence interval (95%CI) for health indicators by labor market status, 1998 and 2003.

	1998			2003		
	OR	95%CI		OR	95%CI	
Low back pain						
Full-time employment with social protection	1,00	-	-	1,00	-	-
Part-time employment with social protection	1,04	0,90	1,01	0,99	0,84	1,17
Full-time employment unprotected	0,99	0,91	1,11	0,89	0,81	0,98
Part-time employment unprotected	1,03	0,89	1,20	1,06	0,91	1,22
Short term unemployment	1,09	0,93	1,27	1,02	0,84	1,24
Long term unemployment	0,80	0,67	0,96	0,90	0,75	1,09
Tendinitis						
Full-time employment with social protection	1,00	-	-	1,00	-	-
Part-time employment with social protection	1,58	1,04	2,39	1,05	0,78	1,42
Full-time employment unprotected	0,93	0,68	1,26	0,61	0,49	0,78
Part-time employment unprotected	0,65	0,38	1,09	0,99	0,73	1,35
Short term unemployment	0,90	0,60	1,36	0,87	0,58	1,30
Long term unemployment	0,53	0,29	0,97	0,76	0,50	1,15
Arthritis/Rheumatism						
Full-time employment with social protection	1,00	-	-	1,00	-	-
Part-time employment with social protection	1,55	1,18	2,05	1,29	0,92	1,82
Full-time employment unprotected	1,14	0,96	1,37	1,22	1,00	1,49
Part-time employment unprotected	1,92	1,47	2,51	1,44	1,08	1,92
Short term unemployment	1,23	0,82	1,85	1,16	0,77	1,74
Long term unemployment	1,58	1,09	2,30	1,26	0,83	1,92
Bronchitis/Asthma						
Full-time employment with social protection	1,00	-	-	1,00	-	-
Part-time employment with social protection	1,17	0,81	1,68	1,30	0,97	1,74
Full-time employment unprotected	1,04	0,82	1,33	0,99	0,82	1,19
Part-time employment unprotected	1,52	1,17	1,98	1,34	1,04	1,73
Short term unemployment	1,25	0,89	1,76	1,23	0,88	1,72
Long term unemployment	1,67	1,24	2,24	1,27	0,96	1,70
Cancer						
Full-time employment with social protection	1,00	-	-	1,00	-	-
Part-time employment with social protection	0,93	0,21	4,03	1,73	0,62	4,83
Full-time employment unprotected	0,42	0,17	1,04	1,20	0,51	2,82
Part-time employment unprotected	0,47	0,17	1,60	3,44	1,49	7,93
Short term unemployment	0,28	0,04	2,17	1,60	0,30	8,61
Long term unemployment	1,06	0,17	6,46	4,43	1,58	12,47

(continue)

Table 3 (continued)

	1998			2003		
	OR	95%CI		OR	95%CI	
Diabetes						
Full-time employment with social protection	1,00	-	-	1,00	-	-
Part-time employment with social protection	1,28	0,91	1,79	0,83	0,55	1,26
Full-time employment unprotected	0,84	0,62	1,15	0,97	0,77	1,23
Part-time employment unprotected	1,08	0,73	1,61	1,07	0,76	1,49
Short term unemployment	0,88	0,45	1,73	0,72	0,41	1,27
Long term unemployment	1,26	0,75	2,09	1,38	1,00	2,13
Hypertension						
Full-time employment with social protection	1,00	-	-	1,00	-	-
Part-time employment with social protection	0,91	0,77	1,09	1,06	0,87	1,29
Full-time employment unprotected	0,87	0,76	0,99	0,83	0,74	0,92
Part-time employment unprotected	0,88	0,76	1,03	1,06	0,90	1,25
Short term unemployment	1,05	0,81	1,37	0,70	0,54	0,90
Long term unemployment	0,89	0,68	1,16	1,08	0,86	1,35
Heart disease						
Full-time employment with social protection	1,00	-	-	1,00	-	-
Part-time employment with social protection	1,04	0,77	1,42	1,36	0,97	1,91
Full-time employment unprotected	1,09	0,89	1,32	0,94	0,76	1,16
Part-time employment unprotected	1,41	1,03	1,92	1,49	1,12	2,00
Short term unemployment	1,54	1,09	2,20	1,41	0,95	2,09
Long term unemployment	1,22	0,81	1,83	1,31	0,87	1,96
Kidney disease						
Full-time employment with social protection	1,00	-	-	1,00	-	-
Part-time employment with social protection	1,25	0,72	2,17	0,97	0,56	1,67
Full-time employment unprotected	1,21	0,94	1,57	0,82	0,60	1,12
Part-time employment unprotected	1,35	0,93	1,95	1,54	1,00	2,36
Short term unemployment	0,91	0,58	1,43	1,54	0,90	2,57
Long term unemployment	0,84	0,54	1,30	0,48	0,23	1,12
Cirrhosis						
Full-time employment with social protection	1,00	-	-	1,00	-	-
Part-time employment with social protection	3,52	1,09	11,36	2,27	0,63	8,11
Full-time employment unprotected	1,77	0,82	3,81	2,71	1,14	6,44
Part-time employment unprotected	4,94	2,26	10,83	4,64	1,60	13,44
Short term unemployment	3,11	0,97	9,94	2,39	0,43	13,44
Long term unemployment	4,61	1,93	11,00	4,06	0,88	18,82
Depression						
Full-time employment with social protection	1,00	-	-	1,00	-	-
Part-time employment with social protection	1,83	1,40	2,41	0,90	0,62	1,31
Full-time employment unprotected	1,31	1,11	1,54	1,10	0,87	1,39
Part-time employment unprotected	1,87	1,48	2,36	1,84	1,38	2,46
Short term unemployment	1,96	1,43	2,69	2,03	1,44	2,88
Long term unemployment	1,98	1,44	2,72	2,22	1,55	3,17
Chronic disease						
Full-time employment with social protection	1,00	-	-	1,00	-	-
Part-time employment with social protection	1,09	0,95	1,27	1,05	0,91	1,22
Full-time employment unprotected	1,00	0,91	1,09	0,94	0,87	1,02
Part-time employment unprotected	1,35	1,18	1,55	1,22	1,07	1,39
Short term unemployment	1,11	0,92	1,35	1,05	0,88	1,26
Long term unemployment	1,26	1,04	1,53	1,26	1,06	1,49

Note: reference (full-time employment with social protection).

negatively associated with hypertension. In 2003, it was strongly and positively associated with cirrhosis and negatively associated with hypertension, low back pain and tendonitis. In 1998, unprotected part-time workers reported arthritis/rheumatism, bronchitis/asthma, heart disease, cirrhosis, depression and chronic disease more often than full-time workers with social protection. These findings were generally in line with those found in 2003, with the exception of cancer. In 1998, short term unemployment was positively associated with heart disease and depression when compared with full-time employment with social protection. In 2003 it was still associated with depression and came to be negatively associated with hypertension. In 1998, long term unemployment was positively associated with arthritis/rheumatism, bronchitis/asthma, cirrhosis, depression and chronic disease and negatively associated with lower back pain and tendonitis. In 2003, it came to be positively associated with cancer, while the association with depression and chronic disease remained significant.

In both years, with the exception of part-time employment with social security, individuals in all other categories had a lower probability of reporting a medical visit in the past 12 months. As for hospitalization, no differences were identified in 1998, but in 2003, unprotected full-time workers reported fewer hospitalizations (Table 4).

Discussion

The present study investigated the association between labor market status and both the reported medical diagnosis of diseases and healthcare use among men living in metropolitan regions of Brazil in 1998 and 2003. Our results show that workers differ in relation to diseases and healthcare use according to their labor situation defined by social protection at work or length of unemployment.

Among the changes identified in the two periods, we identify an increase in the proportion of individuals over 45 years of age, reflecting the trend towards an ageing of the economically-active population [16] and a drop in income affecting all forms of employment studied. In spite of the increase in mean schooling years in 2003, precarious employment links and long term unemployment increased. This means greater levels of exclusion from the social rights that are guaranteed by employment contracts and welfare contributions, and a greater number of unemployed men, especially young ones. Improvements in educational rates occurred in all labor market groups. These facts suggest that access to work or better working conditions are not solely determined by an individual's level of schooling. For instance, the proportion of those with 15 or more years of schooling increased even among the unemployed. In an adverse economic environment, schooling improvement proves to be not enough

Table 4

Odds ratio (OR) and 95% confidence interval (95%CI) for healthcare use indicators by labor market status, 1998 and 2003.

	1998			2003		
	OR	95%CI		OR	95%CI	
Medical visit						
Full-time employment with social protection	1,00	-	-	1,00	-	-
Part-time employment with social protection	1,02	1,00	1,17	0,99	0,87	1,12
Full-time employment unprotected	0,62	0,57	0,70	0,60	0,56	0,64
Part-time employment unprotected	0,75	0,66	0,86	0,74	0,67	0,82
Short term unemployment	0,87	0,77	0,99	0,76	0,67	0,85
Long term unemployment	0,65	0,57	0,75	0,59	0,52	0,66
Hospitalization						
Full-time employment with social protection	1,00	-	-	1,00	-	-
Part-time employment with social protection	1,32	0,99	1,75	0,95	0,69	1,30
Full-time employment unprotected	0,92	0,75	1,14	0,82	0,68	0,98
Part-time employment unprotected	0,98	0,71	1,36	1,15	0,89	1,49
Short term unemployment	1,13	0,78	1,64	0,92	0,65	1,29
Long term unemployment	0,85	0,54	1,32	0,77	0,56	1,11

Notes: reference (full time employment with social protection); OR (IC95%) adjusted for age, schooling and chronic disease.

to guarantee access to work [17] or to reverse the increasing trend towards greater employment insecurity.

Labor market status and health

The association between unemployment and bad health has already been identified in several longitudinal studies [5,18,19,20]. The frequency and length of unemployment intensify its negative effects on health. At any time in life, unemployment is associated with future unemployment, and the number of times an individual has been unemployed has been observed to be strongly associated with the risk of long term disabling diseases [21]. Long term unemployment results in greater deprivation, less chances of getting a new job [22] and greater health risks among youngsters and adults [23]. The high percentage of young individuals unemployed in Brazil is particularly striking, as unemployment in the early stages of life is associated with future unemployment [24]. Furthermore, the longer the period of unemployment the greater its negative effect on health. Our results show that an important fraction of young adults in Brazil are at risk of having poor social and health conditions in the future.

Recent epidemiological research suggests that precarious employment, in a variety of forms, is associated with adverse effects on health. Greater mortality risks have been observed in temporary workers [8], worse mental health in workers without contracts [7] and greater reported chronic diseases and depression in workers with atypical jobs [25]. In the present study, precarious employment has been considered as the one with no guarantee of social rights. It has been shown that working with no contract or social protection coverage is associated with worse health conditions. This result suggests that social inclusion guaranteed by formal employment contracts and/or by having social benefits rights influences or is influenced by health conditions. Considering the high percentage of people in such conditions in Brazil, it is unlikely that health determines an individual's exposure to precarious work situations.

Part-time work is often considered as an atypical or precarious form of employment [22]. In this study, 40 hours per week was adopted as the cut off point for full time employment. Part time unprotected employment was strongly associated with worse health indicators in 1998 and 2003. Unlike unprotected workers, part-time workers with social protection had better schooling and income and were more likely to declare themselves as white, suggesting that part-time employment on its own is not enough to classify work as precarious, as has been suggested elsewhere [3]. In occupations with social protection, part time employment may represent a choice or opportunity, while in unprotected jobs it tends to indicate more precarious circumstances and hazardous working conditions, thus explaining the association with worse health indicators.

The health indicators investigated in this study express different aspects of the health-work relationship. Low back pain and tendonitis, for instance, are conditions frequently associated with working activities. In both years, hepatic cirrhosis was the disease most strongly associated with labor market status, but because of the low prevalence of the disease, confidence intervals are very wide. Excessive alcohol intake is an important risk factor for cirrhosis and may explain its greater occurrence in this group. Workers who frequently switch jobs appear to have a greater probability of high alcohol consumption [26]. Furthermore, a higher risk of death from alcohol-related diseases has already been identified among temporary workers and the unemployed [8].

This study's results suggest that unemployment and precarious employment have an adverse effect on mental health. The association between mental health problems and unemployment, as well as atypical and temporary employment has been observed in studies carried out in Brazil [28] and elsewhere [7,25,27]. In one study among English civil servants, employment characteristics were the most influential factors in the inverse gradient between "employment grade" and depressive symptoms [29]. Unemployment and job insecurity are considered to have a negative influence on mental health not only on account of the financial implications, but also due to the psychosocial aspects such as the breakdown of an individual's time structure, a lack of future perspectives, lower self-esteem and dissatisfaction with the working situation [30].

Inequalities in healthcare use according to labor market position were observed, especially in relation to medical visits. It may seem contradictory that unprotected workers or the unemployed reported higher levels of diseases but fewer medical visits in the two studied periods. This difference remained statistically significant after adjusting for reporting any chronic disease. This may reflect greater access to medical consultations for those covered by a private health plan, since most in this condition also had insured jobs (data not shown). We considered coverage by private health plan as an intermediate variable between labor market position and healthcare use. The lower hospitalization rate observed among unprotected full-time workers in 2003, suggests that inequalities in healthcare use may have become more acute in recent years.

The main study limitation is its cross-sectional design, which does not allow for an assessment of a temporal relationship between labor market status and health conditions. Reverse causality may be considered in explaining these results, especially because we studied reported morbidity and current labor market status, which may have been altered by worse health condition. However, studies show that reverse causality contributes little to inequalities in health [31,32]. For instance, Chandola et al. [30] observed in a longitudinal study of civil servants, that the effect of health on social position changes is much lower than the influence of social positions on health. The healthy-worker effect may also explain, in part, why fewer healthy individuals are unemployed or in precarious occupations [33,34]. However, longitudinal studies suggest a causal association between unemployment, precarious employment and worse health condition [5,35]. Furthermore, the selective and excluding effects of work are influenced by the overall economic environment. In periods of economic recession, economically active populations tend to be even more selective regarding health because more vulnerable health workers tend to be excluded from the active work force, and consequently the health contrasts between those active, i.e., unemployed and employed individuals, is minimized [21]. The high unemployment rate and the increased number of people in precarious employment in Brazil may blur the studied groups, thus diluting the associations between labor market status and health, and even justifying the smaller number of associations observed in 2003.

The relationship between work and illness is a dynamic and complex process. Work is a determinant of health conditions and, at the same time, is interrelated with other socioeconomic indicators. In causal pathways analysis between socioeconomic indicators and health, schooling was seen as directly associated with better health conditions as it positively influences healthier ways of life. At the same time, it was indirectly associated with health because it increases access to better working conditions and higher income [36]. Considering schooling as a confounding variable, we identified independent associations between labor market status and health, but we were not able to clarify the temporal relationship between schooling and labor market status.

The outcomes analyzed in the present study were based on self-reported morbidity. The question relating to morbidity changed between the two surveys. In 1998, the question was "*Do you have*" followed by a list of diseases. In 2003, the question became more specific: "*Has any doctor or health professional said that you have*", followed by the same list of diseases. This greater specificity of the question in 2003 may explain, at least in part, the reduction in the prevalence of most diseases in 2003 (data no shown). The frequency and magnitude of statistically significant associations also reduced in 2003 and might be related to differences in access to health care among working categories.

In the two surveys, information was obtained by household interviews using a proxy informant, when necessary. There seems to be a reasonable agreement between objective health information given by the interviewee himself and by proxy informants [37]. In Canada, prevalences estimated by proxy respondents were very similar to those obtained from the individuals themselves for conditions such as diabetes, epilepsy, heart diseases, glaucoma and cancer [38]. However, unfortunately, there are no studies of this in Brazil. In the present study, the proportion of proxy informants was higher among the long term unemployment and full-time workers, with and without social protection. Thus, the use of a proxy was equally important among the worst and best working conditions being compared. If we consider that the use of a proxy has a non differential distribution, then the associations seen would be diluted.

The drastic changes in the nature and meaning of work have introduced new ways of segmenting the work force. The traditional division between the employed and unemployed is not enough to describe the complexity of modern employment in the world. The study of the relationship between precarious employment and health is a recent issue in public health [39] and different conceptual approaches have been used. These approaches should consider the different socioeconomic contexts of each country. In Brazil, an important fraction of the work force lies outside of the social welfare and labor rights system. Our study showed that precarious work, unemployment and length of unemployment characterize heterogeneous situations in relation to socio-demographic characteristics as well as to disease prevalence and healthcare use. These results seem to be strongly influenced by the macro-economic and social context. Understanding how this context may modify the relationship between the individuals' labor market positions and their health conditions may support further reflection on this issue.

Resumo

Este estudo investiga se trabalho sem proteção social assim como desemprego menor do que 12 meses e superior a 12 meses estão associados à pior condição de saúde. Foram estudados homens com idades entre 15 e 64 anos, residentes em oito regiões metropolitanas que participaram da Pesquisa Nacional por Amostra de Domicílios *em 1998 (n = 31.870) e 2003 (n = 32.887). Comparados ao trabalho com proteção social (≥ 40 horas/semana), trabalho sem proteção social, e desemprego de curta e longa durações foram associados à pior condição de saúde independentemente da idade e escolaridade. Cirrose hepática foi a doença mais fortemente associada com a situação no mercado de trabalho. Sua prevalência foi mais alta entre aqueles inseridos no trabalho sem proteção e com desemprego de longa duração. A situação no mercado de trabalho também foi negativamente associada ao uso de serviços de saúde, especialmente consultas médicas. O presente estudo mostrou que a inserção no trabalho sem proteção social, o desemprego e o tempo de desemprego caracterizam grupos heterogêneos de indivíduos em relação à saúde. Resultados reforçam a necessidade de incorporar a situação no mercado de trabalho nos estudos de desigualdades em saúde.*

Desemprego; Seguro Saúde; Desigualdades em Saúde

Contributors

L. Giatti participated in the study design and was in charge of data analysis and the writing of the paper. S. M. Barreto participated in the study design, data analysis and discussion of the results. C.C. César participated in the data analysis and discussion of the results. All the authors reviewed the manuscript.

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