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Social inequality in health among women in Campinas, São Paulo State, Brazil

Desigualdades sociais na saúde de mulheres adultas no Município de Campinas, São Paulo, Brasil

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Abstract

The aim of this was study was to assess social inequalities in health status and use of health services according to level of schooling in women. This was a cross-sectional population-based study with a sample of 508 women from 20 to 59 years of age living in Campinas, São Paulo State, Brazil (ISA-Camp 2008). Women with less schooling showed higher prevalence of hypertension, circulatory problems, headache, dizziness, obesity, common mental disorders, worse self-rated health, use of dental prosthesis, and visual impairment, but lower prevalence for use of eyeglasses. There were no differences between the two schooling strata in prevalence of medical visits in the previous two weeks, use of medicines in the three previous days, Pap smear, breast self-examination, clinical breast examination, hospitalizations and surgeries in the previous year, and rubella vaccination any time in life. The only significant differences were in use of dental services and mammograms. The results show social inequalities in various health indicators and equity in access to various components of the health services.

Women's Health; Social Inequity; Health Inequalities

Introduction

Women are among the social groups most affected by health inequality, due to their direct experience with discrimination and disadvantages [1]. They constitute the majority of the Brazilian population, participate significantly in the country's workforce (Instituto Brasileiro de Geografia e Estatística. Censo demográfico de 2010. http://www.ibge.gov.br), and play a central role in the organization and care of the family and home. However, women's living conditions differ profoundly, depending on their socioeconomic status, with a differential impact on their health and disease profile.

Among the 12 diseases investigated in the *Brazilian National Household Sample Survey* (PNAD) for 2008, hypertension, back disease, arthritis/rheumatism, depression, bronchitis/asthma, heart disease, diabetes, tendinitis/tenosynovitis, chronic kidney failure, and cancer were significantly more prevalent in women [2]. Importantly, health inequalities are seen between groups of women according to different social characteristics, such as schooling [3], income [4], occupation [5], race and ethnicity, and place of residence [2]. Data from the Telephone Survey Surveillance System for Risk and Protective Factors for Chronic Diseases (VIGITEL) showed a higher prevalence of one or more chronic diseases among women with less schooling [6] and lower prevalence of ar-

terial hypertension in women with more schooling [7]. In American women, low socioeconomic status was also associated with a worse profile of biomarkers for cardiovascular diseases and diabetes [4]. According to a European study, in all 22 countries studied the mortality rate (except for breast cancer) was higher in the group with less schooling, and in the female population 51% of deaths from cardiovascular disease occurred among women with the least schooling [8].

Women use health services more than men, but it has been shown that the women with the highest odds of using health services are those belonging to families with higher income, where the head-of-household has more schooling, and from families headed by men [9]. Social inequalities among women also appear in access to preventive health services. According to a systematic review, access to Pap smears in Brazil was associated with more schooling [10]. Inequality was also found in mammography, where the odds of performing a mammogram increased with per capita family income and schooling, as well as among married women and those with private health insurance [11]. Data from the 2008 PNAD confirm the greater utilization of the public Brazilian Unified National Health System (SUS) by population groups with lower income and less schooling and those without private health insurance, thus demonstrating the importance of the public healthcare service for the socially underprivileged population [12]. Guaranteeing access to the health system for all social groups, especially for the most vulnerable, is essential for minimizing social inequalities in health and compensating for initial socioeconomic iniquity [13].

In the United Nations High-Level Meeting on the Prevention and Control of Non-Communicable Diseases in September 2011, Brazil reaffirmed women's health as a government priority, and thus committed the country to expand access to preventive tests, decrease morbidity and mortality from breast and uterine cervical cancer, and guarantee free access to medicines for hypertension and diabetes, especially for the poorest members of the population, among other objectives [14].

Considering both the importance of policies for the promotion of women's health and the prevailing inequalities between different social segments of the population, the aim of this study was to determine the magnitude of social iniquity in health and in the use of health services among women 20 to 59 years of age living in the urban area of Campinas, São Paulo State, Brazil, according to social strata defined by level of schooling. The study attempted to evaluate the degree of prevailing social inequality in different health dimensions and provide information for more effective interventions to promote equity.

Methods

This was a cross-sectional population-based study that used data from the *Campinas Municipal Health Survey* (ISA-Camp) in 2008, conducted by the Collaborating Center in Health Situation Analysis at the Department of Collective Health, State University in Campinas (Departamento de Saúde Coletiva, Universidade Estadual de Campinas – UNICAMP).

The survey aimed to obtain information on three age brackets: adolescents (10 to 19 years), adults (20 to 59), and elderly (60 years or older). The sample size was defined considering an estimated proportion of 0.50, with a maximum error of 4 to 5 percentage points, with a 95% confidence interval (95%CI) and a design effect of 2, resulting in a thousand individuals for each of the three age brackets. Expecting an 80% response rate, the sample size was corrected to 1,250 individuals in each bracket.

The sampling process in ISA-Camp 2008 involved two stages: census tracts and households. In the first stage, 50 census tracts were selected in the urban area of Campinas with probability proportional to the number of households. Systematic selection was performed, in which the tracts were previously ordered by the percentage of heads-of-families with university degrees. In the second stage, households were selected from the 50 previously selected census tracts. For each age bracket, independent samples of households were selected. Based on the probability of family members from each age bracket living in the household, according to data from the 2000 National Population Census (Instituto Brasileiro de Geografia and Estatística; http://www.ibge.gov.br), 2,150, 700, and 3,900 households were selected, respectively, for interviews with adolescents, adults, and elderly. All household residents belonging to the selected age bracket were interviewed [15].

The current study only analyzed data on female adults 20 to 59 years of age.

Demographic, socioeconomic, health status, health-related behavior, and health services utilization data were obtained from a previously tested structured questionnaire, applied by trained, supervised interviewers. Interviews were conducted directly with the selected individual.

The target variables in this study were:

a) Schooling (used as a proxy for socioeconomic status), defined as years of schooling and categorized as 0 to 8 years versus and 9 years or more;

b) Demographic and socioeconomic variables: age bracket, self-reported skin color/race, marital status, number of children, religion, paid work, per capita monthly family income (calculated as times the monthly minimum wage), number of household assets (radio, TV, refrigerator, freezer, clothes washer, among others), private health plan, and head-of-family's schooling;
c) Health status and diseases: illness in previous two weeks; diseases (reported as having been diagnosed by a physician or other health professional) according to a checklist: arterial hypertension, diabetes, heart disease, rheumatism/arthritis/arthrosis, asthma/bronchitis/emphysema, tendinitis/repetitive strain injury (RSI)/work-related musculoskeletal disorders (WRMD), circulatory problem; number of reported chronic diseases among those listed above; health problem: headache/migraine, back pain/back problem, allergy, emotional problem (anxiety/sadness), dizziness/vertigo, insomnia, and urinary problem; number of self-reported health problems among those listed above; obesity, defined as BMI ≥ 30.0kg/m^2 and estimated according to self-reported weight and height; common mental disorders (CMD) assessed by the *Self-Report Questionnaire* (SRQ-20) with the cutoff set at greater than or equal to 8 points [16], bad/very bad self-rated health; visual impairment, use of eyeglasses and/or contact lenses, use of dental prosthesis, and accident or episode of violence in the previous year;
d) Use of health services: use of health services in the previous two weeks; use of medicines in the previous three days; dental visit, hospitalization, or surgery in the previous year; Pap smear in the previous three years [17]; breast self-examination in the previous month; clinical breast examination in the previous year, for women 40 to 59 years of age [18]; mammogram in the previous two years for women 50 to 59 years of age [18]; and previous rubella vaccination for women 20 to 49 years of age, which covers the childbearing age for susceptibility to congenital rubella syndrome [19].

The dependent variables in this study were those indicating health conditions and use of health services, and the independent variable was level of schooling (in years). The other demographic and socioeconomic variables were used to describe the social characteristics of the two strata of women defined according to level of schooling.

Associations between the variables were measured by the chi-square test with 5% significance. Simple and multiple Poisson regression models with robust variance were used to estimate the crude and adjusted prevalence ratios (PR) and their 95% confidence intervals (95%CI). Age (continuous) was used as an adjustment variable to control for differences in age structure between the two schooling strata, and the number of non-communicable diseases was used to adjust indicators on use of health services, which is influenced by the patient's illnesses. Statistical analyses were performed with Stata version 11.0, module *svy* (Stata Corp., College Station, USA) and considered the sample weights and design effect. The research project was approved by the institutional Review Board of the School of Medicine at UNICAMP (Faculdade de Medicina, in an addendum to case no. 079/2007.

Results

In 19.6% of the households selected for the sample of adults, it was not possible to enroll the individual, either because the person refused to participate (10.1%), was not located (3.7%), or for some other reason (5.8%). Of the 1,082 adults located in the household and who were supposed to be interviewed, the refusal rate was 11.5%. The study sample consisted of 508 women ranging from 20 to 59 years of age, 29.8% of the population of women in the study were 20 to 29 years old, and 19.5% were in the 50-59-year bracket. There was a statistically significant difference ($p < 0.05$) between women in the two schooling strata, in terms of the target demographic and socioeconomic variables (Table 1). The group with more schooling showed a higher proportion of young, white, single, and Catholic women and those with no children, higher monthly per capita family income, more household assets, private health insurance, and heads-of-families with more schooling.

As for health status (Table 2), after adjusting for age, women with less schooling reported higher prevalence of hypertension (PR = 1.58), circulatory problems (PR = 1.92), and two or more chronic diseases among the ten studied (PR = 1.60). Women with less schooling also reported higher prevalence of the following: headache (PR = 1.76), dizziness (PR = 2.03), two or more health problems among the seven studied (PR = 1.37), obesity (PR = 1.49), common mental disorders (PR = 2.10), bad or very bad self-rated health (PR = 2.52), visual impairment (PR = 1.85), and use of dental prosthesis (PR = 4.97). Only prevalence of use of eyeglasses or contact lenses (PR = 0.70) was lower among women with 8 years of school or less, as compared to women with more schooling.

Concerning use of health services, women with less schooling showed significantly lower prevalence rates for dental visits in the previous year (PR = 0.64) and mammograms (PR = 0.63)

Table 1

Demographic and socioeconomic characteristics according to level of schooling among women 20 to 59 years of age. ISA-Camp, Campinas, São Paulo State, Brazil, 2008.

Variables	Total		Schooling (years) 0-8		≥ 9		p-value *
	n	%	n	%	n	%	
Age bracket (years)							< 0.0001
20-29	150	29.8	33	15.3	117	40.4	
30-39	131	26.2	58	26.9	73	25.6	
40-49	126	24.5	62	28.1	64	21.9	
50-59	101	19.5	66	29.7	35	12.1	
Total	508		219		289		
Skin color/Race							0.0093
White	370	73.8	145	66.5	225	79.1	
Black or Brown	135	26.2	73	33.5	62	20.9	
Marital status							< 0.0001
Married	236	46.4	109	49.3	127	44.2	
Living with partner	78	15.3	46	21.3	32	11.0	
Separated/Divorced/Widow	69	13.3	41	18.8	28	9.4	
Single	125	25.0	23	10.6	102	35.4	
Number of children							< 0.0001
0	133	26.8	21	9.7	112	39.1	
1	107	21.3	39	18.1	68	23.6	
2	137	26.8	68	30.9	69	23.8	
≥ 3	131	25.1	91	41.3	40	13.5	
Religion							0.0416
Catholic	251	49.6	98	44.4	153	53.3	
Protestant	183	35.5	95	43.4	88	29.8	
Other/None	74	14.9	26	12.2	48	16.9	
Paid work							0.0003
Yes	307	60.8	112	51.3	195	67.7	
No	201	39.2	107	48.7	94	32.3	
Monthly per capita family income (times minimum wage) **							< 0.0001
< 1	218	42.1	134	61.1	84	28.4	
≥ 1	290	57.9	85	38.9	205	71.6	
Number of household assets							< 0.0001
1-9	287	55.5	168	76.4	119	40.4	
≥ 10	220	44.5	51	23.6	169	59.6	
Private health insurance							< 0.0001
Yes	223	45.0	47	21.6	176	61.9	
No	285	55.0	172	78.4	113	38.1	
Head-of-family's schooling (years)							< 0.0001
0-8	264	50.7	178	81.4	86	28.7	
≥ 9	243	49.3	40	18.6	203	71.3	

* Chi-square test;

** Prevailing monthly minimum wage at the time of the study: January-April 2008: R$415.00 (exchange rate, April 2008: U$1.00 = R$1.69); May 2008 to April 2009: R$450.00 (exchange rate, April 2009: U$1.00 = R$2.19).

Table 2

Prevalence (%) and prevalence ratios (PR) for self-reported diseases and health problems according to level of schooling among women 20 to 59 years of age. ISA-Camp, Campinas, São Paulo State, Brazil, 2008.

Variables	Schooling (years)			p-value *	Crude PR (95%CI) **	Adjusted PR (95%CI) ***
	Total %	0-8 %	≥ 9 %			
Hypertension	16.5	24.8	10.6	**< 0.0001**	**2.34 (1.59-3.46)**	**1.58 (1.04-2.42)**
Diabetes	4.6	6.3	3.4	0.1331	1.85 (0.81-4.21)	1.11 (0.48-2.58)
Heart disease	4.2	6.2	2.7	0.0686	2.35 (0.91-6.10)	1.69 (0.65-4.37)
Rheumatism/Arthritis/Arthrosis	5.8	9.1	3.4	**0.0055**	**2.69 (1.32-5.48)**	1.33 (0.58-3.01)
Asthma/Bronchitis/Emphysema	4.1	4.6	3.8	0.6410	1.23 (0.50-3.04)	0.98 (0.39-2.45)
Tendinitis/RSI/WRMD	7.5	7.3	7.6	0.9080	0.97 (0.53-1.76)	0.76 (0.42-1.39)
Circulatory problem	12.5	20.4	6.8	**< 0.0001**	**3.01 (1.97-4.60)**	**1.92 (1.20-3.05)**
Prevalence of ≥ 2 chronic diseases	17.2	26.3	10.6	**0.0001**	**2.48 (1.59-3.87)**	**1.60 (0.99-2.57)**
Headache/Migraine	34.7	45.1	27.2	**0.0001**	**1.66 (1.30-2.11)**	**1.76 (1.37-2.26)**
Backache/Back problem	35.1	43.8	28.8	**0.0061**	**1.52 (1.13-2.05)**	1.31 (0.97-1.77)
Allergy	32.5	29.7	34.5	0.3072	0.86 (0.64-1.15)	0.86 (0.64-1.16)
Emotional problem (anxiety/sadness)	25.6	31.2	21.5	**0.0263**	**1.45 (1.05-2.00)**	1.30 (0.91-1.85)
Dizziness/Vertigo	12.6	19.1	7.9	**0.0001**	**2.42 (1.56-3.76)**	**2.03 (1.23-3.36)**
Insomnia	19.9	25.1	16.1	**0.0364**	**1.56 (1.02-2.37)**	1.23 (0.76-1.98)
Urinary problem	4.8	6.7	3.5	0.1176	1.91 (0.83-4.40)	1.75 (0.72-4.24)
Prevalence of ≥ 2 health problems	46.4	56.6	39.1	**0.0006**	**1.45 (1.17-1.79)**	**1.37 (1.08-1.73)**
Illness (previous 2 weeks)	21.9	25.6	19.2	0.1088	1.33 (0.94-1.90)	1.25 (0.85-1.85)
Obesity (BMI ≥ 30kg/m^2)	17.7	23.7	13.3	**0.0005**	**1.78 (1.29-2.45)**	**1.49 (1.05-2.13)**
CMD (SRQ-20)	11.9	18.4	7.2	**0.0002**	**2.56 (1.56-4.21)**	2.10 (1.25-3.53)
Bad/very bad self-rated health	7.5	12.3	4.1	**0.0049**	**3.01 (1.35-6.69)**	**2.52 (1.04-6.09)**
Visual impairment	13.6	19.6	9.2	**0.0028**	**2.12 (1.27-3.53)**	**1.85 (1.09-3.15)**
Eyeglasses and/or contact lenses	44.4	42.4	45.8	0.4281	0.93 (0.76-1.12)	**0.70 (0.58-0.84)**
Dental prosthesis	14.2	28.8	3.6	**< 0.0001**	**7.98 (3.90-16.32)**	**4.97 (2.30-10.78)**
Accident (previous year)	5.5	7.2	4.3	0.2762	1.66 (0.65-4.23)	1.65 (0.65-4.21)
Violence (previous year)	5.5	6.0	5.2	0.6247	1.16 (0.62-2.17)	1.17 (0.58-2.36)

BMI: body mass index; CMD: common mental disorders; RSI: repetitive strain injury; SRQ-20: *Self-Report Questionnaire*; WRMD: work-related musculoskeletal; 95%CI: 95% confidence interval.

* Chi-square test;

** Simple Poisson regression model. Reference category: ≥ 9 years of schooling;

*** Multivariate Poisson regression model. Adjustment variable: age.

Note: Statistically significant values in boldface. Confidence interval does not include 1.

in the previous two years (Table 3). There were no statistically significant differences between the two levels of schooling in relation to use of health services in the previous two weeks, use of medicines in the previous three days, or hospitalization and surgeries in the previous year, even when the analysis was adjusted for number of self-reported diseases. Neither were there any differences in monthly breast self-examination, clinical breast examination in the previous year, Pap smear in the previous three years, or previous rubella vaccination.

Discussion

The current study's most significant findings were the striking socioeconomic inequality between the two schooling strata in this population of women, expressed as disparities in various health problems, and the absence of inequalities in relation to various indicators for use of health services.

The strong association between socioeconomic and demographic variables and schooling revealed two distinct social segments: as expected, women with less schooling showed

Table 3

Prevalence (%) and prevalence ratios (PR) for use of health services according to level of schooling in women 20 to 59 years of age. ISA-Camp, Campinas, São Paulo State, Brazil, 2008.

Variables	Schooling (years)			p-value *	Crude PR (95%CI) **	Adjusted PR (95%PR) ***
	Total %	0-8 %	≥ 9 %			
Use of health service (previous 2 weeks)	22.2	22.1	22.4	0.9351	0.99 (0.71-1.38)	0.84 (0.59-1.20) #
Use of medicines (previous 3 days)	64.1	66.7	62.2	0.3120	1.07 (0.93-1.23)	0.96 (0.85-1.09) #
Dental visit (previous year)	59.7	46.4	69.4	**0.0001**	**0.67 (0.56-0.79)**	**0.64 (0.54-0.77)**
Hospitalization (previous year)	11.1	12.1	10.3	0.4607	1.17 (0.76-1.80)	1.18 (0.74-1.88) #
Surgery (previous year)	12.8	10.5	14.7	0.1270	0.71 (0.46-1.11)	0.76 (0.46-1.25) #
Pap smear (previous 3 years)	86.2	83.8	87.9	0.2630	0.95 (0.87-1.04)	0.94 (0.86-1.02)
Breast self-examination (previous month)	38.2	38.3	38.1	0.9621	1.01 (0.78-1.29)	0.87 (0.68-1.12)
Clinical breast examination (previous year) [40-59 years]	57.5	50.4	66.1	**0.0167**	**0.76 (0.61-0.95)**	0.80 (0.63-1.02)
Mammogram (previous 2 years) [50-59 years]	62.1	51.3	80.8	**0.0013**	**0.64 (0.50-0.81)**	**0.63 (0.50-0.80)**
Previous rubella vaccination [20-49 years]	86.2	84.2	87.3	0.4868	0.96 (0.86-1.07)	0.86 (0.67-1.11)

* Chi-square test;

** Simple Poisson regression model. Reference category: ≥ 9 years of schooling;

*** Multiple Poisson regression model. Adjustment variable: age;

Adjusted for age and number of chronic non-communicable diseases.

Note: Statistically significant values in boldface. Confidence interval does not include 1.

worse living conditions. Schooling is one of the most widely used indicators for analyzing social inequalities in health [3,8] and is known to continue to impact the social class dimension [20]. The study's reference was the theoretical model on social determinants of health by Solar & Irwin [21]. According to this model, education (related to the political and socioeconomic context) is among the structural determinants of iniquities in health, together with income and occupation. Schooling influences the material circumstances of life (living conditions, work, food availability, etc.), behavioral, biological, and psychosocial factors that generate impact on equity in health, well-being, and use of health services, just as the prevalence of diseases also impacts the use of health services. As a social determinant, education is related to the individual's position in society, social stratification, and the underlying causes of health iniquities [22]. The historical context in which women's schooling has occurred (marked by gender, socioeconomic, and power inequalities) continues to be reflected in their current living conditions and labor market position and earnings. Although the schooling variable does not capture all the effect of socioeconomic status on health, it is easier to obtain than other socioeconomic indicators, so it is widely used, allowing greater comparability and good stability (since, for a significant portion of the population, it is basically complete by late adolescence). There were proportionally more young women in the stratum with higher schooling, a result of increasing access to the Brazilian educational system that has occurred progressively in the younger generations. The selected cutoff point considered the level of schooling in the target population and the available sample size, which was satisfactory for the analyses in each category. As shown in Table 1, the indicator used in this study was able to discriminate between the two social strata.

The current study found a higher age-adjusted prevalence ratio for two or more chronic diseases in the group with less schooling. Data from the PNAD survey in 2003 and 2008 and the VIGITEL survey in 2006 also showed the strong influence of schooling on the prevalence of non-communicable diseases [2,6]. Studies in other countries have also consistently found health inequality in the prevalence of non-communicable diseases [3,23].

In this study, hypertension was 1.58 times more prevalent among women with less schooling, corroborating other studies focusing on women in Brazil [7] and elsewhere [4,24].

Women with less schooling also showed a twofold higher prevalence of circulatory problems, defined in this study as varicose veins or stroke. Social inequalities in the prevalence of

circulatory problems have been reported by other authors [4]. In Brazil, in 2008, a downward prevalence was observed in heart disease among strata with more schooling [2].

As for women's self-reported health problems, less schooling was associated with higher prevalence of frequent headache or migraine. In a population-based study in Denmark, increased risk of migraine in women was associated with less schooling, marital status (married), unemployment, heavy physical workload, obesity, and smoking [25]. Data from a prospective cohort study of 22,718 adults showed that schooling, income, and occupation were associated with differences in frequent and chronic headache [26]. According to some authors, the association between socioeconomic status and headache can have many causes, such as stress and unhealthy lifestyle, which are more prevalent in economically underprivileged groups [25]. However, various studies in Brazil [27] and elsewhere [28] failed to find an association between migraine and socioeconomic status, thus highlighting the need for further research on the theme.

Dizziness was approximately twice as prevalent in women with less schooling. A study in Germany in individuals 18 years or older found an association between schooling and vertigo in both the univariate and adjusted analyses, which persisted after adjusting for age and gender [29]. In a study of migraine patients, dizziness and vertigo were frequent symptoms, more intense and lasting longer on days in which headache was present [30]. The current study found a statistically significant association between headache/migraine and dizziness/vertigo ($p < 0.01$) (data not shown).

Social inequalities in prevalence of obesity in women have been reported consistently by studies in Brazil [31] and elsewhere [32]. In the current study, obesity was 50% more prevalent among women with less schooling, reaching 23.7% of this group. In a study using data from the 2006 VIGITEL survey, 11% of women 18 years or older presented obesity, which was 1.96 times more prevalent among women with four years of schooling or less (as compared to 12 years or more) [31]. A cross-sectional study in 19 European countries found an inverse gradient between schooling and overweight/obesity among women 25 to 44 years of age [32]. Low socioeconomic status not only limited access to more expensive food with higher nutritional value but also influenced access to information on health and the adoption of healthy behaviors, including the choice of healthy diet [33].

The current study showed 2.10 times more CMD (common mental disorders) among women with less schooling. An inverse association between schooling and CMD has been reported in other Brazilian studies [34,35]. Even in more developed countries, schooling is a socioeconomic variable strongly associated with CMD [36]. According to some authors, by providing better possibilities for improving living conditions, schooling influences attitudes and behaviors that produce positive effects on mental health [37].

The prevalence of bad or very bad self-rated health in the female population was 2.52 times higher among women with less schooling. Data from the VIGITEL survey in the population 18 years or older showed 3.11 times higher prevalence of bad self-rated health in women with 8 years of schooling or less as compared to those with 12 years or more; in addition, the strong effect of schooling was not eliminated when health-related behaviors were included in the regression model [38]. This result indicates that health behaviors do not entirely explain the socioeconomic differences in self-rated health, as proposed in the theory based on behaviors/lifestyle, which emphasizes the role of individual choices. However, behaviors represent relevant mediators of the effect of schooling on self-rated health. Inadequate health behaviors are the principal avoidable risk factors for non-communicable diseases and are more prevalent in social strata with less schooling [38]. Other studies in Brazil and elsewhere confirm the existence of social inequality in self-rated health among women [6,39].

This study also showed inequality in the frequency of visual impairment, defined in this study as difficulty seeing or blindness in one or both eyes. A study in four regions of the State of São Paulo showed higher prevalence of visual impairment among individuals whose head-of-family had less schooling [40]. A relevant finding for Campinas was that although visual impairment was 1.85 times more prevalent among women with less schooling, they were less likely to wear eyeglasses and/or contact lenses (PR = 0.70). Considering that only 4.7% of visual impairments involve blindness in one eye (data not shown), most visual impairments could be entirely or partially corrected by eyeglasses or lenses. These data demonstrate the need to expand access to ophthalmology services for socially vulnerable groups.

Differences in health conditions between women from different social strata in Campinas reflect the effect of schooling on the unequal distribution of living conditions that differentially expose groups in the female population to situations involving greater vulnerability to health harms. Education, as a social determinant, is related to the conditions in which persons are

born, live, grow, work, and age, which account for most of the disease burden [22].

One of this study's most relevant findings was the absence of inequality between the two schooling strata in terms of access to most of the health services analyzed here. No statistically significant differences were found in: use of health services in the previous two weeks, medicines in the previous three days, and hospitalization or surgery in the previous year, even after adjusting for the number of reported diseases. Prevalence of Pap smear according to the recommended schedule, monthly breast self-examination, clinical breast examination in the previous year, and previous rubella vaccination also showed no differences between the two social strata. These data for Campinas, differ from findings in other Brazilian studies, frequently showing inequality in access to health services. Although social inequalities in access to use of health services were attenuated somewhat between 2003 and 2008 according to the respective PNAD surveys, social conditions continue to heavily influence the use of health services in the Brazilian context [12]. In Brazil, it has been demonstrated that the odds of using health services are higher among individuals with 9 years of schooling or more as compared to those with four years or less [41]. However, the various studies have used different numbers of social strata and different cutoff points.

This study in Campinas, found a significant inequality in access to dental services, corroborating other Brazilian studies [42,43]. However, women with less schooling were much more likely to use dental prostheses, as compared to women with more schooling. The inference is that the former lacked sufficient access to preventive and restorative dental service in order to avoid tooth loss, but that they did subsequently have access to the use of dental prostheses. The study did not delve more deeply into questions related to dental prostheses, such as type, site, and the period of life in which the treatment occurred, so it was not possible to conclude whether such access was through the public Unified National Health System, private health plans, or out-of-pocket. Social inequalities in personal hygiene and the search for and use of dental services and difficulty in access to restorative treatment in the public healthcare system could partially explain tooth loss in the lower-income population [44].

Equitable access to Pap smears as shown in this study has not been seen in other studies in Brazil [10], just as it was not a few years ago in Campinas. Data from 2001 in the city showed that the test was significantly less frequent in women with 4 years of schooling or less and among black or brown women [45]. According to the current study, access to Pap smears has improved, and the public SUS, as structured in Campinas, has now provided equitable access to the test, given that 55% of women in Campinas depend on the public system.

Unlike Pap smears, there is still important inequality in access to mammograms, as shown already in 2001 [46]. The supply of mammograms for the lower-income population is still insufficient, despite an increase in the percentage of women that have this test in Campinas. Other studies have confirmed the direct relationship between this test and socioeconomic status in Brazil [11]. The lack of equipment and trained human resources are possible factors that hinder equity in access to mammograms in Campinas. The persistence of this inequality in access to mammograms requires urgent measures by health services, since breast cancer is the leading cause of death from malignant tumors among women in Campinas [47].

Some limitations in the current study result from the cross-sectional design, which does not allow causal inferences; although the total number of women interviewed was adequate for estimating most of the prevalence rates, it was insufficient for some less frequent diseases and events. The use of self-reported information is also a limitation. Some chronic diseases can be underestimated, since the disease is only recognized after a diagnosis is performed by a health professional. The magnitude of differences between disease prevalence rates in the schooling strata tends to be underestimated due to the more limited access to medical and diagnostic services by individuals with less schooling, meaning that they are more likely to be unaware of the fact that they have certain diseases. The validity of self-reported information on chronic disease depends on the given disease, comorbidities, and the respondent's sociodemographic characteristics [48]. Still, the use of a checklist [49] and a face-to-face interview [50], as in the current study, allows establishing direct contact between the interviewer and interviewee, thus fostering better interaction and on-site verification of the latter's living conditions, thus contributing to the validity of the resulting information. Another limitation was that the sample size did not allow working with a larger number of schooling strata, which would have permitted detecting gradients between the various strata. Although the sample size was calculated for adults, and this study only included adult women, we obtained a design effect (*deff*), which is a parameter that signals the precision of the estimates obtained from a complex sampling as compared to that of a simple random sample, close to 1.2 for the tests of association

between level of schooling and various variables. This means that for a prevalence of 0.50 in the stratum of women with more schooling, the actual samples of 242 and 184 would be sufficient to detect (with a power of at least 80% and 5% type-I error), significant differences of 1 for PR less than 0.72 and greater than 1.28. Therefore, the complex design effect did not compromise the precision of the estimates in this subgroup of women for the majority of the tests. However, one can assume that for some of the tests, with PR from 0.72 to 1.28, the study power was insufficient to identify differences as significant [51]. The study's thematic scope allows analyzing social inequalities in diverse health aspects, besides monitoring health iniquities, which is essential for supporting and evaluating public health policies [52].

To reduce social inequalities in health, among other interventions, it is necessary to expand the coverage and quality of health services, which can improve the diagnosis, control, and treatment of diseases [2]. The equity in many components of the health services in Campinas demonstrates the potential of the SUS to minimize initial social inequalities, and the access to Pap smears proves the capacity to improve access. Meanwhile, without overlooking other government sectors, the differences identified in the health and disease of the Brazilian female population show the need for the SUS to prioritize effective actions in health promotion and equity, capable of remediating the inequalities in the risks of falling ill and dying.

The diversity in Brazil in the structuring and advances in organization of the SUS highlight the importance of local studies analyzing the situation with health conditions and access to health services. To the extent that this study provides local data on women's health, it can contribute to specific public policies, since decentralization of the SUS fosters measures that meet the specificities, especially considering the more vulnerable social groups.

Resumo

Objetivou-se avaliar as desigualdades sociais no estado de saúde e uso de serviços de saúde segundo o nível de escolaridade entre mulheres adultas. Trata-se de um estudo transversal de base populacional com amostra de 508 mulheres de 20 a 59 anos, residentes em Campinas, São Paulo, Brasil (ISA-Camp 2008). Mulheres com menor escolaridade apresentam maior prevalência de hipertensão, problemas circulatórios, dor de cabeça, tontura, obesidade, transtorno mental comum, pior saúde autorreferida, uso de prótese dentária e deficiência visual, mas menor prevalência de uso de óculos. Não houve diferença entre os dois segmentos na prevalência de consultas nas duas últimas semanas, uso de medicamentos nos últimos três dias, exame de Papanicolaou, autoexame das mamas, exame clínico das mamas, hospitalizações e cirurgias no último ano e vacinação contra rubéola na vida. Diferenças significativas foram apenas em relação ao serviço odontológico e à mamografia. Há presença de desigualdades sociais em diversos indicadores de saúde e de equidade no acesso a vários componentes dos serviços de saúde.

Saúde da Mulher; Iniquidade Social; Desigualdades em Saúde

Contributors

C. Senicato prepared the proposal for the article and conducted the literature search, data analysis, and writing of the article. M. B. A. Barros supervised the proposal, data analysis, and writing of the article.

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