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# Collective efficacy and depressive symptoms in Brazilian elderly

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### ABSTRACT

The objective was to investigate the association between depressive symptoms and collective efficacy among the elderly in a municipality in southern Brazil. A cross-sectional population-based design was carried out. Structured interviews were held at the homes of 1007 elderly individuals. The presence of depressive symptoms was measured using the Geriatric Depression Scale, exposures were a standard 8-item collective efficacy scale and a single item about elderly participation in groups. Data were analyzed using Poisson regression to obtain the crude and adjusted prevalence ratios (PRs). The sample consisted mostly of female (63%), white (96%) and married (64%) elderly individuals. The mean age, income and educational level were, respectively: 73 years (SD = 4), R\$ 1836 (SD = 2170) and 5 years of education (SD = 4). After controlling for demographic, socioeconomic, behavioral and health-related variables, participants who reported low collective efficacy at the places where they lived presented a prevalence of depressive symptoms that was twice as high as the prevalence among those who reported high collective efficacy. In the same way, elderly individuals who did not participate in groups presented prevalence of the outcome around 64% higher than among those who took part in one or more groups. The study suggests that creation of and participation in social networks and community groups may be an important strategy for promoting mental health among the elderly.

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## 1. Introduction

In many countries, older adults are the fastest growing portion of the total population. It has been estimated that in 2050 there will be two billion people aged over 60 years in the world (WHO, 2002). Every year, around 650,000 new elderly individuals are incorporated into the Brazilian population, which went from 3 million in 1960 to 7 million in 1975 and to 20 million in 2008 (Veras, 2009).

This rapid and profound transformation in the age structure of the Brazilian population has been accompanied by a progressive increase in life expectancy (WHO, 2010). Greater longevity implies increased morbidity due to noncommunicable chronic diseases, which mostly lead to incapacity among the elderly, thus

demanding greater healthcare expenditure (Alves, Leite Ida, & Machado, 2008; Duarte & Rego, 2007).

In this context, depression and depressive disorders can be considered a public health problem, in view of their growing prevalence and the decreased quality of life it causes among the elderly (Duarte & Rego, 2007). In addition to emotional distress, depression in this age group can contribute negatively toward many health problems, which makes adequate treatment difficult and promotes increased mortality (Alexopoulos, 2005; Blazer, 2003).

Studies have indicated that the etiology of depression in the elderly population seems to involve a combination of biological, psychological and social factors (Blazer, 2003; Blazer & Hybels, 2005; Lindau, Laumann, Levinson, & Waite, 2003).

Loneliness, social isolation, illiteracy and exposure to conflict situations predispose the elderly to deficiency and to early death (WHO, 2002). Unfavorable psychosocial factors have been associated with increased mortality, morbidity and psychological affliction (Cacioppo & Cacioppo, 2014; WHO, 2002). In this regard, investigations on social capital, understood as social relations, norms and networks that enable participants to act together more

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effectively to pursue mutual benefit trust (Coleman, 1990; Putnam, Leonardi, & Nanetti, 1993), have suggested that higher levels of social capital may have a positive effect on the health (Kim, Subramanian, & Kawachi, 2008) and mental health of adults and elderly individuals (Almedom, 2005; Cagney & Wen, 2008, chap. 11; De Silva, McKenzie, Harpham & Huttly, 2005; WHO, 2002). This may be because residents of neighborhoods with greater social control may be able to cope with or to reduce stressful events more efficiently, while living in socially cohesive neighborhoods may also help buffering effects of stressful events by the provision of social support to residents (Kim, 2008; Kawachi & Berkman, 2001).

The main objective of the present study was to investigate the association between collective efficacy, a dimension of social capital (Harpham, 2008) defined as social cohesion among neighbors combined with their willingness to intervene on behalf of the common good (Sampson, Raudenbush, & Earls, 1997), and depressive symptoms among the elderly in a small-sized municipality in southern Brazil. The hypothesis was that elderly individuals reporting lower levels of collective efficacy would have higher prevalence of depressive symptoms. So far this research question has not been tested in Latin America (Kripper & Sapag, 2009; Pattussi, Moyses, Junges, & Sheiham, 2006).

## 2. Methods

This study had a cross-sectional population-based design and evaluated elderly individuals (aged 60 years or over) who were living in the urban and rural zones of the municipality of Veranópolis, Rio Grande do Sul. According to data from the latest Brazilian census in 2010, the number of elderly individuals in the municipality is 3493, i.e. around 15.3% of the population (IBGE, 2013). The municipality of Veranópolis has been targeted in several studies assessing successful aging among its elderly population. This population presents a life expectancy similar to that observed in developed countries, ethnical homogeneity (95% of the population are descendents from Italian immigrants) and a socioeconomic-cultural profile with few disparities, which are characteristics that favor investigations in this field (Marafon, da Cruz, Schwanke, & Moriguchi, 2003). The Human Development Index of the municipality in 2000 was 0.85.

Data were gathered between January and May 2009, by means of structured interviews, using a standardized and pretested questionnaire composed of demographic, socioeconomic, psychosocial, behavioral, health condition-related and morbidity-related variables. A pilot study on 20 elderly individuals from the municipality who were not part of the main sample served as the basis for evaluating the quality of the instruments, as well as for appraising the methods and logistics of the study.

The sample size was originally calculated for the outcome of flu vaccination coverage, using the following parameters: prevalence of 67.1% among the exposed individuals (men), ratio of exposed/non-exposed of 1/1 and 80% power to detect an odds ratio of 1.5, which resulted in a requirement for a total sample size of 988 individuals. After adding 15% for losses, a total of 1136 elderly individuals were invited to participate. For the outcome of depressive symptoms, which was the focus of the present survey, this sample size had 80% power to detect a difference of seven percentage points between exposed and nonexposed individuals, with a significance level of 5% and a confidence level of 95%.

Sample selection was carried out through a systematic random process. To do so, a list of eligible individuals was obtained from the Municipal Health Department, containing the names and telephone numbers of these elderly people. Elderly people with severe cognitive problems or with any incapacity or disease that would not allow them to answer the questionnaire were excluded from the sample.

The study outcome was evaluated through the Geriatric Depression Scale (GDS-30). GDS is one of the instruments most used for screening for depressive symptoms among the elderly. It was first described in English by Yesavage et al. (1982) and is comprised of 30 items developed especially for screening mood disorders among the elderly, with questions that avoided the sphere of somatic complaints. Each answer compatible with depressive symptoms was awarded one point. Elderly individuals with scores above 10 points ( $\geq 11$  points) were considered to have depressive symptoms. This has been considered the optimum cut-off point, based on the ROC curve, for the diagnostic of major depression using the GDS-30 in a Brazilian population (Castelo et al., 2010).

The exposure of interest was assessed by the collective efficacy scale created by Sampson et al. (1997) and by means of a single item regarding elderly people's participation in community groups. The scale comprises 10 items with statements that evaluate the constructs of informal social control and social cohesion. Informal social control refers to the capacity of a group to regulate its members according to their own principles (Sampson et al., 1997). The five items that formed this construct dealt with the interviewees perceptions regarding help received from neighbors in cases of trouble occurring in the neighborhood, such as teenagers skipping school and wandering in the street, doing graffiti on walls or public buildings, showing disrespect toward an adult; neighbors assisting in critical situations such as a fight; and closure of the nearest healthcare unit. Another factor measured by the scale was social cohesion, i.e. trust and solidarity among neighbors. For this, questions such as the following were used: whether the neighbors helped each other; whether the neighborhood was united and friendly; whether people could be trusted; whether people got along with each other; and whether people had the same values.

This scale showed good validity in the original paper (Sampson et al., 1997). The response categories for these items were measured by means of a Likert-like scale of five points, which evaluated the level of agreement with the abovementioned statements. The collective efficacy variable corresponded to the sum of these 10 items. Similarly, the items relating to each subscale were summed so as to construct the informal social control and social cohesion variables. Higher scores represented greater levels of the constructs. These variables were categorized as follows: high (highest 25% of the scores), moderate (intermediate 50% of the scores) and low (lowest 25% of the scores).

Finally, the item of participation in community groups, an indicator of social capital, evaluated the individuals' participation in elderly, religious, community association, political party, cultural and sports groups and in meetings with friends.

The demographic variables included sex, age group (60–69 years, 70–79 years and 80 years or over), skin color (white and nonwhite) and marital status (married, widowed and separated/single). The socioeconomic variables were family income in Brazilian Real (R\$) and educational level in years of schooling, which were both categorized based on their quartiles. The behavioral variables were smoking (nonsmoker, former smoker and current smoker); physical activity (practice and do not practice); consumption of fruits and vegetables ( $\geq 9$  spoons/day, 5–8 spoons/day and  $\leq 4$  spoons/day); consumption of alcohol assessed as the number of days that the person usually consumes alcoholic beverages and was categorized into: high (5–7 days/week), moderate (1–4 days/week) and does not drink (almost never or never). The factors relating to health conditions and presence of morbidities included: self-perception of health (excellent/very good/good or fair/poor); presence of morbidity (no disease, one morbidity, two morbidities, and three or more morbidities); and number of consultations with a doctor in the last

month (no consultation, one consultation, and two or more consultations).

The quality control for the data gathering was done over the telephone, on a random sample of 10% of the people who took part in the study. The control instrument was similar to that of the study, including variables that did not undergo alterations over a short length of time.

Data entry was carried out in the Epi Info 6 software, version 6.0 (Centers for Disease Control and Prevention, Atlanta, United States), with double entry and subsequent comparison, so as to eliminate typing mistakes. The data analysis was conducted using the Stata 11.0 software (Stata Corp., College Station, United States). To estimate crude and adjusted PRs and their respective 95% confidence intervals (95% CI), Poisson regression with robust variance was used. Only potential confounding factors entered the multivariable analysis. To be considered as a confounder, the independent variable needed to be associated both with the exposure at a significance level lower than 10% ( $p < 0.10$ ).

The research protocol was approved by the Research Ethics Committee of Universidade do Vale do Rio dos Sinos (Resolution 100, of December 18, 2008). The participants were required to sign a free and informed consent statement before entering the study, and confidentiality of their data was guaranteed.

### 3. Results

From the 1136 elderly individuals initially selected, 1012 (89%) participated in the study. The main reasons for losses were: wrong address (9.5%), refusals (1%) and deaths (0.5%). Five people presented incomplete data on depressive symptoms. Therefore, the data analysis was conducted on 1007 elderly individuals.

The sample consisted mostly of female, white (96%) and married (64%) elderly individuals. The mean age, income and educational level were, respectively: 73 years (SD = 4), R\$ 1836.00 (SD = 2170.00) and 5 years of education (SD = 4) (Table 1).

The prevalence of depressive symptoms was 27.3% (95% CI: 24.6–30.1). Greater prevalence ( $p < 0.05$ ) was found among women, older participants, widows, individuals with lower income and educational level, those who did not practice physical activity, those with low consumption of fruit and vegetables, those with an unfavorable self-perception of health and those who presented some sort of functional dependency. Among the main exposures (collective efficacy, informal social control and social cohesion), the prevalence of depressive symptoms presented a gradient, i.e. the more unfavorable the exposure was, the greater the prevalence of the outcome was (Tables 1 and 2).

The crude analysis demonstrated that the exposures were strongly associated with the outcome. The PRs for depressive symptoms were close to twice as great among the elderly people who reported low social cohesion, low informal social control, low collective efficacy and non-participation in groups, in comparison with those reporting more favorable exposures. For example, participants who reported low collective efficacy where they lived presented a prevalence of depressive symptoms twice as great as did those who reported high collective efficacy. Similarly, the prevalence of depressive symptoms was also around twice as much among the elderly individuals who did not participate in community groups, compared with those who participated in one or more groups (Table 2).

In the adjusted analysis, the effect of the exposures remained independent of the demographic, socioeconomic, behavioral and health-related factors. Regarding social cohesion, after adjustment for marital status, educational level, physical activity and functional capacity, elderly individuals who reported low social cohesion at the places where they lived presented prevalence of depressive symptoms around 52% greater than among reporting

**Table 1**

Distribution of the sample according to the demographic, socioeconomic, behavioral and psychosocial variables relating to depressive symptoms among elderly people in Veranópolis, Rio Grande do Sul, Brazil, 2012 (N = 1007).

Variables	n (%)	% of depressive symptoms	95% CI	p-value <sup>a</sup>
<b>Demographic variables</b>				
<i>Sex</i>				
Male	378 (37.4)	14.7	11.1–18.3	<0.001
Female	634 (62.6)	34.8	31.1–38.5	
<i>Age group</i>				
60–69	403 (39.8)	22.8	18.7–26.9	0.008
70–79	400 (39.5)	29.3	28.4–33.8	
≥80	209 (20.7)	32.2	25.7–38.6	
<i>Skin color</i>				
White	968 (95.7)	27.5	9.8–35.6	0.485
Nonwhite	44 (4.3)	22.7	24.7–30.3	
<i>Marital status</i>				
Married	648 (64.0)	21.5	18.3–24.7	<0.001
Widowed	291 (28.8)	39.4	33.8–45.1	
Separated/Single	73 (7.2)	30.6	19.7–41.5	
<b>Socioeconomic variables</b>				
<i>Years of schooling</i>				
≥7 years	210 (20.8)	21.5	15.9–27.1	<0.001
3–6 years	589 (58.2)	25.3	21.8–28.9	
0–2 years	213 (21.0)	38.6	31.9–45.2	
<i>Income</i>				
≥R\$ 2075	251 (24.8)	20.4	15.4–25.4	<0.001
R\$ 2075–930	539 (53.3)	25.7	22.9–29.9	
R\$ 0–929	222 (21.9)	39.1	32.6–45.2	
<b>Behavioral variables</b>				
<i>Smoking</i>				
Nonsmoker	758 (74.9)	28.5	25.3–31.7	0.193
Former smoker	213 (21.0)	25.0	19.1–30.9	
Smoker	41 (4.1)	17.1	5–29.1	
<i>Physical activity</i>				
Practice	580 (57.3)	18.1	15.2–21.2	<0.001
Do not practiced	432 (42.7)	39.8	35.2–44.5	
<i>Consumption of vegetables</i>				
≥9 spoons	363 (35.9)	22.8	18.4–27.1	0.003
5–8 spoons	410 (40.5)	27.4	23–31.7	
4–0 spoons	239 (23.6)	34.0	28–40.1	
<i>Alcohol consumption</i>				
Moderate consumption	65 (6.4)	21.5	11.3–31.8	0.257
Does not drink	875 (86.5)	28.9	25.8–31.9	
High consumption	72 (7.1)	13.9	5.7–22.1	
<b>Health variables</b>				
<i>Self-perception of health</i>				
Excellent/Very good/Good	542 (53.6)	14.1	11.1–17	<0.001
Fair/Poor	470 (46.4)	42.6	38.1–47.1	
<i>Presence of morbidity</i>				
No disease	242 (23.9)	12.9	8.6–17.1	<0.001
1 morbidity	367 (36.3)	24.6	20.2–29	
2 morbidities	256 (25.3)	31.9	26.1–37.7	
≥3 morbidities	147 (14.5)	50.0	41.8–58.2	
<i>Consultations with a doctor</i>				
Did not consult	565 (55.8)	22.4	19–25.9	<0.001
1 consultation	378 (37.4)	31.6	27–36.4	
≥2 consultations	69 (6.8)	43.5	31.5–55.5	
<i>Physical capacity</i>				
Independent	858 (84.8)	24.1	21.3–27	<0.001
Dependent	154 (15.2)	45.6	37.5–53.7	
<b>Psychosocial variables</b>				
<i>Social cohesion</i>				
High (≥P75% points)	241 (23.8)	18.7	13.7–23.6	<0.001
Moderate (>P25% < P75%)	494 (48.9)	27.5	23.5–31.5	
Low (≤P25%)	276 (27.3)	34.5	28.9–40.2	
<i>Informal social control</i>				
High (≥P75% points)	155 (15.3)	20.0	13.7–26.4	<0.001
Moderate (>P25% < P75%)	584 (57.8)	24.6	21.1–28.1	
Low (≤P25%)	271 (26.8)	37.2	31.4–43	

**Table 1** (Continued)

Variables	n (%)	% of depressive symptoms	95% CI	p-value <sup>a</sup>
<b>Collective efficacy</b>				
High ( $\geq$ P75% points)	210 (20.8)	19.0	13.7–24.4	<0.001
Moderate ( $>$ P25% < P75%)	554 (54.9)	25.4	21.7–29	
Low ( $\leq$ P25%)	246 (24.4)	38.5	32.4–44.7	
<b>Participation in groups</b>				
1 or more groups	359 (35.5)	15.6	11.8–19.4	<0.001
Does not participate	648 (65.5)	33.8	30.1–37.4	

<sup>a</sup> Pearson's or linear by linear association chi-square test.

high social cohesion. Regarding informal social control, after adjustment for age group, marital status, physical activity and medical consultations, the prevalence of the outcome was 54% greater in places with low social control, compared with those with high social control. In relation to collective efficacy, after adjustment for skin color, educational level, marital status, physical activity, morbidity and self-perception of health, the prevalence of depressive symptoms was 40% greater among the elderly people who reported low collective efficacy in their at the places where they lived, in comparison with those who reported high collective efficacy (Table 2).

Regarding the elderly people's participation in community groups, after adjustment for age group, skin color, marital status, income, physical activity, consumption of greens and vegetables, consumption of alcohol, morbidities, self-perception of health and functional capacity, the prevalence of the outcome was around 64% greater among the elderly individuals who did not take part in groups, compared with those who participated in one or more groups (Table 2).

#### 4. Discussion

The present study sought to investigate the association between collective efficacy and depressive symptoms among Brazilian elderly people. Those who reported lower levels of collective efficacy at the places where they lived and those who did

not participate in groups presented greater prevalence of depressive symptoms. These associations were independent of demographic, socioeconomic, behavioral and health condition-related factors. To the best of our knowledge we could not find studies using the same instruments as we used to assess outcome and exposure. Using the same measure of collective efficacy and different instruments for depressive symptoms, Ahern and Galea (2011) in New York, Gary, Stark, and Laveist (2007) in Baltimore and Chou (2012) in Hong Kong reported higher collective efficacy to be associated with lower prevalences of depressive symptoms. Other studies on social capital literature found similar results. A study carried out in Japan among 5956 individuals showed that, after adjustment for sociodemographic variables, high levels of cognitive social capital (measured by trust) and high levels of structural social capital (measured by the participation in sport or leisure activities, hobbies or cultural groups), were associated with better psychological health (Hamano et al., 2010). In another study on English elderly individuals, participants who reported a strong sense of cohesion in their neighborhood and fewer problems with the neighborhood presented higher levels of positive mental health, regardless of their socioeconomic situation, income, health condition and perceived social support (Gale, Dennison, Cooper, & Sayer, 2011). Also concordant with the results found in the present investigation, another study carried out among Swedish elderly individuals demonstrated that the structural social capital measured by only one item relating to confidence was associated with the presence of depressive symptoms, evaluated by means of the GDS-15 (Nyqvist, Gustavsson, & Gustafson, 2006). These previous studies corroborate the results of the present research, through showing a strong association between social capital and mental health among elderly people. However, absence of association between social capital and depressive symptoms has also been reported (Lofors & Sundquist, 2007; Mulvaney-Day, Alegría, & Sribney, 2007; Veenstra, 2005).

Regarding participation in groups, a systematic review followed by a meta-analysis showed that social activities (especially those that provide an active role for the participants) contributed significantly toward reduction of depressive symptoms and improvement in the mental health and quality of life of the elderly (Forsman, Nordmyr, & Wahlbeck, 2011). A study conducted

**Table 2**

Crude and adjusted analysis using Poisson regression for factors associated with depressive symptoms among elderly people in Veranópolis, Rio Grande do Sul, Brazil, 2012 (N = 1007).

Variable	Crude analysis			Adjusted analysis		
	PR	95% CI	P value	PR	95% CI	P value
<b>Social cohesion</b>						
High ( $\geq$ P75%)	1		<0.001	1		0.006
Medium (P25%–P75%)	1.47	(1.09–1.99)		1.29 <sup>a</sup>	(0.96–1.73)	
Low ( $\leq$ P25%)	1.85	(1.36–2.52)		1.52 <sup>a</sup>	(1.12–2.06)	
<b>Informal social control</b>						
High ( $\geq$ P75%)	1		<0.001	1		0.001
Medium (P25%–P75%)	1.23	(0.87–1.74)		1.09 <sup>b</sup>	(0.78–1.53)	
Low ( $\leq$ P25%)	1.86	(1.31–2.64)		1.54 <sup>b</sup>	(1.09–2.17)	
<b>Collective efficacy</b>						
High ( $\geq$ P75%)	1		<0.001	1		0.009
Medium (P25%–P75%)	1.33	(0.97–1.82)		1.06 <sup>c</sup>	(0.79–1.43)	
Low ( $\leq$ P25%)	2.02	(1.47–2.79)		1.40 <sup>c</sup>	(1.03–1.91)	
<b>Participation in groups</b>						
One or more groups	1		<0.001	1		0.001
Does not participate	2.17	(1.66–2.82)		1.64 <sup>d</sup>	(1.27–2.12)	

<sup>a</sup> Adjustment for marital status, educational level, physical activity and functional capacity.

<sup>b</sup> Adjustment for age group, marital status, physical activity and consultations with doctor.

<sup>c</sup> Adjustment for skin color, educational level, marital status, physical activity, morbidity and self-perception of health.

<sup>d</sup> Adjustment for age group, skin color, marital status, income, physical activity, consumption of vegetables, consumption of alcohol, morbidities, self-perception of health and functional capacity.

among 166 elderly people in Washington, DC, USA, demonstrated that in comparison with a group of elderly individuals who did not take part in social activities, the group that participated reported better general physical health, fewer consultations with doctors, less use of medications, fewer cases of falls and fewer other health problems (Cohen et al., 2006).

Several action mechanisms of action have been proposed to explain the relationship between social capital and mental health. There has been argued discussion that breaking social bonds could affect the defense systems of the organism, thereby making it more susceptible to diseases (Gale et al., 2011; Griep, Chor, Faerstein, Werneck, & Lopes, 2005; Harpham, Grant, & Rodriguez, 2004; Pollack & Von dem Knesebeck, 2004; Ziersch, 2005; Ziersch, Baum, Macdougall, & Putland, 2005). Thus, sociability could act as a protective factor against chronic diseases (Ahern & Hendryx, 2005; Sapag & Kawachi, 2007). Social capital could also influence healthcare behavior through widening access and increasing retention of preventive and promotional health-related information related to health (Kawachi & Berkman, 2001). For example, greater level of community engagement through has been associated with better recall of health messages. Ties with community groups contributed independently toward better recall of the message even after controlling for sex, educational level and other variables (Viswanath, Randolph Steele, & Finnegan, 2006). In addition, higher rates of smoking and lower rates of physical activity have been reported in socially unstructured neighborhoods, i.e. with lower levels of social capital (Echeverria, Diez-Roux, Shea, Borrell, & Jackson, 2008). It has also been suggested that communities with high levels of social capital have better access to health care services (Harpham, Grant, & Thomas, 2002).

Another explanation has suggested a psychological mechanism, such that a social network could influence self-esteem through offering support in high stress situations, thus improving individual well-being (Cullen & Whiteford, 2001). Participation in groups would also promote distraction, fun and, most of all, the feeling of belonging to a group (Barbour & Blumenthal, 2005; Guimarães & Caldas, 2006). In this regard, a qualitative–quantitative study on the social representations of depression demonstrated that an element of sadness permeates the discourse of the elderly, thus indicating, among other elements, that social isolation is one of the possible causes of depression. In addition, among the elderly individuals studied, the most expressive type of treatment was anchored in psychosocial perspectives, such as social recreational activities (listening to cheerful music, dancing, participating in games, talking to friends, going out and walking around, having distractions and doing activities) (Coutinho, Gontiẽs, Araújo, & Sá, 2003).

Thus, the social environment, i.e. the available resources, the links among neighbors and the networks that exist, is of great importance for the community and especially for the elderly people that live there (Ross & Jang, 2000). Generally, neighborhoods with low collective efficacy present greater levels of violence and criminality (Kruger, Reischl, & Gee, 2007; Pérez, 2010; Sampson et al., 1997). Fear of walking around the neighborhood at night was reported by the elderly people living in places where the collective efficacy of the neighborhood was low (Pérez, 2010). Lack of security in the neighborhood and fear of leaving the house are relevant because these can influence the social living of the elderly, thus impeding or hindering living with neighbors and within society, and gaining access to health-related services and information. Elderly individuals in a small American community with higher levels of satisfaction with the neighborhood reported lower levels of stress and depressive symptoms (Kruger et al., 2007). This would therefore be an indirect benefit provided by collective efficacy of the neighborhood.

Nevertheless, the results regarding the association reported here need to be discussed in the light of consideration some methodological limitations. Cross-sectional studies are limited to identification of associations, and cannot establish causal relationships. Thus, reverse causality may exist, since both exposure and outcome are measured at the same moment in time, and so it is not possible to specify whether the exposure preceded or resulted in the disease. The absence of social bonds could be both anterior to and concomitant with mental distress. As an example, certain personality traits, such as introversion, are associated with lack of participation in a social network and also with the occurrence of depressive symptoms (Kawachi & Berkman, 2001). However, in the present study, it seems unlikely that the high rates of depressive symptoms among these individuals could reduce their social capital or that of the area. Another limitation of the study is in relation to possible errors of measurement of the exposure and outcome. New studies should be conducted using biological markers for depression. Regarding the exposure, although the questionnaire used to assess social capital has not been validated for Brazilian cultural context, there is still no consensus on the best way to measure social capital. On the other hand, this study had a representative sample of elderly individuals and high external data validity, which may assist in planning and defining local public policies.

The presence of depressive symptoms among the elderly generates a series of negative repercussions, from increased expenditure on medications to hospital admissions due to morbidities caused by the presence of these symptoms (Alexopoulos, 2005; Duarte & Rego, 2007). The present study suggests that creation of and participation in social networks and community groups can be an important strategy for promoting mental health among the elderly. This would be in addition to investments in social policies, safe community environments and adequate infrastructure that benefit the physical and mental health of the elderly.

### Conflict of interest

The authors declare that there are no conflicts of interest.

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