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Is religion affiliation associated with overweight and obesity in Brazil?

Abstract

Although the process of the Brazilian population's weight gain is relatively well-documented, studies relating religion to this phenomenon in Brazil have not yet been done. There is a significant gap in the literature about the possible associations between religion and health in several societies that must be filled. Aiming to contribute to the filling of this gap, this article intends to research the possible associations between religion, overweight and obesity using data from the adult population in Brazil in 2008. This study used data from the National Research on Social Inequalities done on 2008 by the Center for Studies of Wealth and Social Stratification (CERES), of the Institute of Social and Political Studies (IESP). The universe of the research was formed by the residential address of all of the states and urban or rural regions in Brazil. Information regarding the household, the head of the household, and spouses was collected. In total, 8,048 households were visited, and information from 12,326 individuals was collected. Preliminary results showed a strong association between obesity and membership with mainline Protestant, Pentecostal, and Neopentecostal churches in Brazil, even after adjusting the factors that affect the Body Mass Index (BMI).

Introduction

Several studies have shown that, in the last 40 years, Brazil no longer displays a high prevalence of malnutrition, and it has changed having a high prevalence of overweight and obesity instead (Batista Filho et al 2008; Coutinho, Gentil and Toral, 2008; Macinko, Guanais and Souza, 2006; Uauy and Monteiro, 2004; Bermudez and Tucker, 2003). Currently, it can be said that Brazil is facing an obesity epidemic (Lima et al, 2015; Malta et al, 2016). Data from the Brazilian Institute of Geography and Statistics (IBGE) indicate that 50.1% of adult men are overweight, and that 12.4% of these are obese in Brazil. Among women, 48% are overweight and 16.9% are obese (IBGE, 2012).

In spite of biological factors such as genetics and metabolism have a strong role in determining a person's gaining of excessive weight, certain aspects such as inadequate eating habits and a sedentary lifestyle, among other aspects of one's lifestyle, present a higher impact on the risk of becoming obese (Le Blanc, 2016; Vilchis-Gil et al, 2015; Faghri, Stratton and Momeni, 2015; Bray and Popkin, 1998).

Although the process of the Brazilian population's weight gain is relatively well-documented, studies relating religion to this phenomenon in Brazil have not yet been done. According to Ellison and Hummer (2010), there is a significant gap in the literature about the possible associations between religion and health in several societies that must be filled. Aiming to contribute to the filling of this gap, this article intends to research the possible associations between religion, overweight and obesity using data from the adult population in Brazil in 2008.

Religion and obesity

Several studies describe the way religion may influence body weight, both positively and negatively. Low rates of obesity among religious persons usually are associated with the promotion of health behaviors (less alcohol consumption and more physical activities), healthy coping behaviors, stress reduction, improved psychosocial functioning (lower depression and anxiety and higher social support) and healthier eating (e.g. increased fish, green vegetables and fruit intake and vegetarianism) (Reeves et al., 2012; Gillum, 2006; Roff et al., 2005; Kim, Sobal and Wethington, 2003). Gluttony, one of the deadly sins, is the object of moral constraint in religious settings (Cline and Ferraro, 2006) and being overweight has a negative impact on the image of religious leaders (Gerber, 2012). Also, fasting is part of the Christian ascetic practices, and is promoted as a purifying activity in historical Catholicism (Bynum, 1987) and among Puritans and Methodists (Gerbe, 2012). However, not all religious denominations condemn gluttony with the same intensity, which in some cases is considered an “accepted vice” (Gerber, 2012; Cline and Ferraro, 2006), and food is seen as “one of the few available sources of earthy pleasure” (Sack, 2001). Besides, religious gatherings frequently involve eating (Krause et al., 2002) and food is used instead of alcohol as a celebratory good (Sack, 2001).

There are also differences in the way religious denominations perceive physical exercise and dieting. While some consider more important to focus on spiritual matters and portray concerns with the physical appearance as vanity (Gerber, 2012), others teach that the body is the “temple of the Holy Spirit” and therefore should receive good care (Gerber, 2012; Cline and Ferraro, 2006; George, Ellison, and Larson 2002; Ellison and Levin 1998; Levin 1994). Moreover, religion can be associated with higher rates of obesity as a consequence of its success in curtailing smoking, which is an appetite suppressant (Reeves, 2012; Cline and Ferraro, 2006; Gillum, 2006). Kim, Sobal and Wethington (2003) also argue that it is possible that an opposite causal relationship exists between religion and obesity, as a form of social selection; people who are obese tend to be more religious because they find a welcoming

and consoling environment in religious organizations, and a protection from social stigma (Cline and Ferraro, 2006; Kim, Sobal and Wethington, 2003). Furthermore, religion groups often promote body acceptance and self-worth, preserving their adherents from social pressures to be thin, which may lead them to be less involved in body weight control than those more exposed to societal norm of thinness (Kim, 2007). Finally, there is an association of health behaviors and concepts of control and agency. Believing in the control power of God can be related to decreased weight control behavior, once this external locus of control can make the individual less proactive. However, there are contradictory studies about this issue (Kim, 2007; Benjamins, 2012).

Overall, the relationship between religion and obesity is still ambiguous and needs to be better elucidated. There are studies associating religiosity with a healthier diet and/or physical activity (Benjamins, 2012; Salmoirago-Blotcher et al., 2011; Ayers et. al., 2010; Hill et al., 2006; Hart et al., 2004; Wallace and Forman, 1998;), while others associate it with higher body weight and/or obesity (Mason, Xu and Bartkowski, 2013; Feinstein et al., 2010; Cline and Ferraro, 2006; Kim, Sobal, and Wethington, 2003; Lapane et al., 1997; Oman and Reed, 1998; Ferraro, 1998) and some found no significant relationship (Reeves et. al. 2012; Ellis and Biglione, 2000; Roff et al., 2005). Gillum (2006) observed a positive association between frequency attendance at religious services with overweight or obesity prevalence, but the correlation lost significance after controlling for sociodemographic, health, and smoking variables. Despite this inconsistency and contradiction among the researches results, there is agreement about the important role religion can play in promoting healthier behaviors such as proper eating habits and physical exercise. The development of a faith-based weight loss intervention is a feasible, culturally acceptable and effective way to treat obesity (Krukowskiet et al., 2010), since “religion represents one of the most available and authoritative institutions to aid adherents in avoiding obesity” (Cline and Ferraro, 2006).

Data and methods

Data

This study used data from the National Research on Social Inequalities done on 2008 by the Center for Studies of Wealth and Social Stratification (CERES), of the Institute of Social and Political Studies (IESP). The research involved 25 researchers in 16 institutions of 7 states in the country, with the aim of understanding and monitoring the dynamics of the inequality and social mobility in Brazil.

The universe of the research was formed by the residential address of all of the states and urban or rural regions in Brazil. Information regarding the household, the head of the household, and spouses was collected. In total, 8,048 households were visited, and information from 12,326 individuals was collected.

Variables

Weight measure

Body Mass Index (BMI) was used as markers of obesity. Height and weight were used for the calculations, and these were collected in the moment of the survey, with the data being grouped in this way, Normal (BMI 18.5–24.9 Kg/m^2), Overweight (BMI 25–29.9 Kg/m^2) and Obesity (BMI 30 or greater Kg/m^2)

Religion

The religious denomination was used as independent variable. Denominations were grouped in this way: Catholic, Mainline Protestant, Pentecostal, Neo-pentecostal, Agnostic, Other and Non religion.

Socioeconomic, demographic and health behavior variables

n this study, sex, age, race/color, education, marital status, socioeconomic status (SES), alcohol intake, smoking status and self-perceived health were used as a control variables. Sex variable was assessed in men and women, race/color in blacks and whites, and marital status was assessed in three categories: never married, married and divorced, widowed, or separeted. Region was disaggregated in five categories: North, Northeast, South, Southeast and Center-West. Alcohol Intake was separated in three levels: non drinker, light drinker and heavy drinker; smoking status was separated in three levels too: non smoker, ex-smoker and smoker. Self-perceived health was disaggregated in five levels: excellent, very good, good, fair and bad. Age, education and SES were used in continuous scale. For age and education variables were used simple years, and SES was used a scale to 1 for 8, been 1 lowest level and 8 highest level.

Analyses

This study used frequency analysis for all variables and distribution analysis of the relationship between religion and obesity. After this, a multinomial logistic regression was conducted to verify possible relationship between religion and overweight/obesity. Four regression models were run to test that relationship. In Model 1 overweight and obesity was regressed on religion variables. In Model 2 demographic and socioeconomic variables were included in Model, to test the role of these variables as a mediator to the religion and overweight and obesity. In Model 3 demographic and socioeconomics variables were replaced for the health behavior variables (alcohol intake, smoking status and self-perceived health) and in Model 4 were included all control variables. For running the models, was used SPSS 15.

Results

Table 1

Variables	Distribution (%)
Body Mass Index	
Normal	44,7
Overweight	35,4
Obese	19,8
Religion	
Non religion	2,1
Catholic	64,3
Mainline Protestant	4,5
Pentecostal	13,1
Neo-pentecostal	3,0
Agnostic	6,8
Other	6,1
Gender	
Male	42,8
Female	57,2
Age (mean)	
Age	48,4 (15,8)*
Race-color	
White	48,7
Black	51,3
Education (mean)	
Education	6,7 (4,4)*
Marital status	
Never married	9,2
Married	71,6
Divorced/widowed	19,2
Socioeconomic status (mean)	
SES	3,3(1,3)*
Region	
Center-West	4,9
North	4,8
Northeast	26,2
Southeast	48,0
South	16,1
Smoking status	
Nonsmoker	56,3
Ex-smoker	25,0
Smoker	18,7
Drinking status	
Nondrinker	60,6
Light drinker	29,9
Heavy drinker	9,5
Self-perceived health	
Bad	8,0
Excellent	10,5
Very good	12,7
Good	37,2
Fair	31,6
N	11348

Source: National Research on Social Inequalities, 2008.

Table 2

Religion	Normal	Overweight	Obese
Non religion	55,6	30,3	14,1
Catholic	45,1	36,0	18,9
Mainline Protestant	45,6	33,9	20,5
Pentecostal	41,5	35,8	22,7
Neo-pentecostal	39,2	32,6	28,2
Agnostic	48,6	36,3	15,1
Other	41,8	31,8	26,3
Total	44,7	35,4	19,9

Source: National Research on Social Inequalities, 2008.

Table 3

Variables	Model 1		Model 2		Model 3		Model 4	
	Overweight	Obesity	Overweight	Obesity	Overweight	Obesity	Overweight	Obesity
	Exp (B)	Exp (B)	Exp (B)	Exp (B)	Exp (B)	Exp (B)	Exp (B)	Exp (B)
Religion								
Non religion(ref)	*	*	*	*	*	*	*	*
Catholic	1,29†	1,55*	1,31†	1,30	1,21***	1,33	1,27	1,26
Mainline Protestant	1,20	1,65*	1,30	1,46†	1,09	1,38	1,23	1,37
Pentecostal	1,44*	2,18***	1,51**	1,77**	1,26	1,68**	1,39*	1,58**
Neo-pentecostal	1,32	2,13***	1,37	2,12***	1,16	1,66*	1,26	1,91**
Agnostic	1,14	1,19	1,35†	1,09	1,11	1,11	1,33†	1,06
Other	1,27	2,30***	1,18	1,74**	1,19	2,01***	1,13	1,64*
Gender								
Male (ref)			*	*			*	*
Female			0,99	1,61***			0,92†	1,47***
Age (years)								
Age			1,01***	1,01***			1,01***	1,01***
Race-color								
White (ref)			*	*			*	*
Black			1,00	1,06			0,99	1,05
Education (years)								
Education			0,96	0,83***			0,97	0,86***
Marital status								
Never married (ref)			*	*			*	*
Married			1,08	1,31**			1,05	1,06
Divorced/widowed			0,99	1,24*			0,99	1,09
Socioeconomic status								
SES			1,14***	1,31***			1,15***	1,34***
Region								
Center-West (ref)			*	*			*	*
North			1,18	1,06			1,19	1,10
Northeast			1,11	1,30*			1,10	1,25
Southeast			0,95	1,21†			1,00	1,39**
South			1,21†	1,67***			1,26*	1,76***
Smoking status								
Nonsmoker (Ref)					*	*	*	*
Ex-smoker					1,11*	1,14*	1,01	1,20***
Smoker					0,68***	0,48***	0,69***	0,50***
Drinking status								
Nondrinker (Ref)					*	*	*	*
Light drinker					1,02	1,01	1,05	1,13†
Heavy drinker					0,94	0,95	0,93	1,05
Self-perceived health								
Bad (Ref)					*	*	*	*
Excellent					0,74***	0,32***	0,72***	0,32***
Very good					0,68***	0,34***	0,65***	0,32***
Good					0,83*	0,49***	0,81**	0,50***
Fair					1,00	0,79**	1,00	0,76**

Source: National Research on Social Inequalities, 2008.

†0.10; *0.05; **0.01; ***0.001

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