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199

DISCUSSION PAPER

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Luis Claudio Kubota

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Brasília, January 2015

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ABSTRACT

PeNSE 2012 is a survey conducted by the Brazilian Institute of Geography and Statistics (IBGE), in partnership with the Ministry of Health. PeNSE covers a broad range of subjects, especially risk behavior. This article has the aim of analyzing discrimination against obese and very thin students using PeNSE microdata. Data indicate that students that classify themselves as “very fat” or “very thin” are much more prone to risk behaviors like consumption of illicit drugs, alcohol, cigarettes and laxatives (or vomit inducing), when compared to “normal” pupils. They are also much more likely to suffer from frequent bullying (FB), especially that motivated by their body appearance, to be active bullies, to feel frequently lonely, to suffer from insomnia, family violence, aggressions and injuries. A great percentage was involved in fights and feel that their parents rarely or never understand their problems and preoccupations. Econometric model shows that non “normal” students have a greater chance of suffering FB than “normal” pupils. Male students have greater chance of being frequently discriminated when compared to the female ones. There is no statistical difference between public and private schools. Black, yellow and Indian students have greater chance of suffering FB than white pupils. Students whose mothers didn’t study have greater chance of suffering FB than those whose mothers have completed high school education.

Keywords: obesity; thinness; discrimination; bullying; students.

SINOPSE

A Pesquisa Nacional de Saúde do Escolar (PeNSE) 2012, realizada pelo Instituto Brasileiro de Geografia e Estatística (IBGE), em parceria com o Ministério da Saúde (MS), abrange um amplo leque de assuntos, com destaque para comportamentos de risco. Este artigo tem o objetivo de analisar a discriminação contra estudantes obesos e muito magros, utilizando microdados da PeNSE. Os dados indicam que alunos que se autoclassificam “muito gordos” ou “muito magros” são muito mais propensos a comportamentos de risco, como o consumo de drogas ilícitas, álcool, cigarros e laxantes (ou indução ao vômito), quando comparados com alunos “normais”. Eles também são muito mais sujeitos a sofrer *bullying* frequente (BF) – especialmente aquele motivado por sua aparência corporal, a serem *bullies* ativos, a sentirem solidão, a sofrerem de insônia, violência familiar, agressões e lesões. Um elevado percentual está envolvido em brigas e

avalia que seus pais raramente ou nunca entendem seus problemas e preocupações. O modelo econométrico implementado mostra que estudantes não “normais” têm mais chance de sofrer BF que os “normais”. Os alunos do sexo masculino têm maior chance de ser discriminados em relação às alunas. Não há diferença estatisticamente significativa entre escolas públicas e privadas. Alunos pretos, amarelos e indígenas têm maior chance de sofrer BF em relação aos brancos. Estudantes cujas mães não estudaram têm maior chance de sofrer BF em relação àqueles cujas mães têm ensino médio completo.

Palavras-chave: obesidade; magreza; discriminação; *bullying*; estudantes.

1 INTRODUCTION

Body weight is determined by a complex interaction of biological and environmental variables, which include, among others: genetics¹, age, sex, income, quantities and quality of food intakes, physical activity, existence of medical conditions and even – according to recent studies – the kind of bacteria in the intestines.² Nevertheless, society largely attributes the responsibility of overweight to the individuals, and associates those that are obese with laziness and other negative attributes.

On the one hand, contemporary standards of beauty in western society praise thinness, especially for female individuals. On the other hand, low cost processed foods are rich in trans and saturated fats, high fructose corn syrup, processed flours and other substances that contribute to weight gain. And the modern lifestyle leads people to spend less and less calories in physical activities.

According to Swinburn *et al.* (2011), obesity is the result of people responding normally to the obesogenic environments in which they live. As an example of what an obesogenic environment means, Thornton *et al.* (2012) studied the availability of snack food displays that may trigger impulse purchases in Melbourne supermarkets and found out that the exposure is almost unavoidable, regardless of socioeconomic status of the neighborhood. This reality is probably the same in other parts of the world, including Brazil. Schlindwein and Kassouf (2007), for instance, show how the consumption of processed food increased over the last decades in Brazil.

One negative aspect of obesity is that it is associated to the occurrence of medical conditions like type 2 diabetes, hypertension, hypercholesterolemia, coronary heart disease, stroke, asthma and arthritis. There are estimated economic costs in the Brazilian case. According to Bahia *et al.* (2012), the annual cost of diseases related to overweight and obesity in Brazil is around US\$ 2.1 billion, and 10% of this value is due to these two factors. Oliveira (2013) estimated that the costs attributable to obesity in 2011 were R\$ 487,98 million in 2011, what represents 1.9% of the costs associated with medium and high complexity assistance.

1. Oliveira *et al.* (2007) conducted a study of the influence of family nucleus on obesity in children in the Brazilian northeast.

2. See <http://gordonlab.wustl.edu/>. Access in 23 Sep. 2013.

Other negative aspect of obesity is related to the stigma that overweight individuals face. Even though the literature is limited in what regards to prejudice against very thin individuals, this will also be the focus of this study, as this kind of discrimination appeared in the data analyzed. This study will analyze the discrimination against overweight and very thin students in Brazilian schools, based on data from the National Survey of Student Health (PeNSE).

Several studies were conducted using PeNSE 2009 data: bullying (Malta *et al.*, 2010a), food consumption (Levy *et al.*, 2010), nutritional status (Araújo *et al.*, 2010), body image (Castro *et al.*, 2010), physical activity (Hallal *et al.*, 2010), risk health behavior (Malta *et al.*, 2010b). However, the study of bullying did not consider body image as a dimension of analysis.

The article is organized as follows. Section 2 presents the literature review. Section 3 explains the sample design of PeNSE, and also mentions studies that were based on this survey. Section 4 brings the results of the study which includes descriptive statistics as well as a logit model to identify the determinants of frequent bullying. Finally, section 5 brings the discussion and concluding remarks.

2 LITERATURE REVIEW

2.1 Stigma based on body image

Stigma is defined by Jones *et al.* (1984) as a mark that links a person to undesirable characteristics. The preface of the classic text of Goffman (1986) defines stigma as “the situation of the individual who is disqualified from full social acceptance”. Puhl and Heuer (2009) point that discrimination against obese individuals occurs in employment settings – hiring, wages, promotions, pejorative remarks and unfair job terminations -, health-care settings, educational settings, interpersonal relationships and in the media. Muennig (2008) also points that there is evidence that parents have prejudice against their obese children,³ doctors against obese patients⁴ and husband against obese wives.

3. Report from the World Health Organization informs that there is emerging evidence of the development of obesity due to child maltreatment (World Health Organization, 2013).

4. A testimony of a regretful physician can be seen at: http://www.ted.com/talks/peter_attia_what_if_we_re_wrong_about_diabetes.html. Access in 23 Sep. 2013.

Puhl and Latner (2007) suggest that teachers and school faculty may be biased against overweight children.

Obese individuals have higher rates of depression, anxiety disorders and suicide than the general population, besides facing social isolation. Obesity is one of the most stigmatized health conditions in contemporary society (Lewis *et al.*, 2010). As a result of this discrimination, obese individuals are more likely to suffer from lower self-esteem than leaner persons.

Ribas Filho *et al.* (2009) conducted a study to evaluate the stigmatization of obese among 304 public school students of São Paulo State, using caricatures of youngsters (normal, obese, anorexic, handicapped with wheelchair, handicapped with crutch, amputated handicapped and burnt). Results confirm that obese were very stigmatized, as were anorexic thin and burnt people.

Gonçalves *et al.* (2012) conducted a study of auto declared discrimination among teenagers born in 1993 in Pelotas, Rio Grande do Sul. For the young males, being thin increased the prevalence of discrimination, while for the girls the risk was greater for those obese. In the case of the female, prejudice was greater for the wealthier than for the poorer.

Freitas *et al.* (2012) present positive results of a small sample of obese adolescents that were treated by a multidisciplinary group. Levels of dissatisfaction with body image decreased from 81% to 61%.

Muennig (2008) argues that pathophysiology arises not only from adiposity, but also from the stress caused by social stigma from being obese. Puhl and Latner (2007) add that stigmatization could hinder social, emotional and academic development and could aggravate medical outcomes that obese individuals face.

2.2 Questions to be considered in public policies related to body weight

Swinburn *et al.* (2011) point four market failures regarding food marketed to the children. The first happens because children are a vulnerable group that is not being protected. They are not mature or have the nutritional knowledge to perceive the risk of their choices. The

second is related to the fact that consumers don't have the information necessary to make fully informed decisions about their food selection. The third market failure occurs because people prioritize immediate gratification over potential long-term results. The fourth relates to externalities when costs of obesity are borne by society. An Australian government report states just the opposite: "There appear to be few such 'market failures' relating to obesity in children (or adults)" (Crowle and Turner, 2010, p. XIX).

Swinburn *et al.* (2011) defend that there is ample justification for government action in the protection of children from "predatory effects of markets". "Governments can employ a range of policy tools including price instruments (such as taxes or subsidies), helping consumers be better informed (education and information), and regulatory measures that influence consumer or producer choices" (Crowle and Turner, 2010, p. XXI).

Brunello, De Paola and Labartino (2012) investigated the effect of European Union (EU) School Fruit campaign in Rome during 2010 and 2011, and found evidence that it resulted in reduced consumption of unhealthy snacks in high income areas, but not in poorer neighborhoods. Repeated treatment did not strengthen the effects of the program. Crowle and Turner (2010) conducted a survey of obesity-related interventions in Australia and overseas and results overall show small differences in treated and control groups, even though in some cases other positive results were observed, like reduction of soft drinks consumption. As a general rule, consumers have limited responsiveness to food taxes. There is also no strong evidence of causal relationship between children's food preferences, advertising and weight outcomes.

Benjamin *et al.* (2008) investigated United States state regulations related to childhood obesity for child care centers and family child care homes and found out that there is considerable variation among federation units.

In what regards to public campaigns, there are important aspects to consider. Individuals give more credibility to sources of information like family, friends, known health professionals, and may be skeptical about government messages. Lewis *et al.* (2010) defend that public campaigns need to address anti-stigma, and that messages that emphasize the role of personal responsibility may lead people to feel blamed and disconnected from the message.

Lewis *et al.* (2010) investigated 142 obese Australian individuals. Many participants felt that the focus of the public campaigns were on the societal costs of individual who failed to maintain a “normal” weight than on helping obese individuals. Many also mentioned that messages focused too much on obesity rather than on the risk behaviors that lead to this condition: unhealthy eating and drinking, lack of physical activity. Some also mentioned that health campaigns also made them feel more isolated. Many felt frustrated for not being able to achieve a societal norm.

O’Dea (2004) suggests that the exponential rise in disordered eating that followed the early “control your weight” messages resulted in a huge challenge to health educators, that had to deal with wrong conceptions of body image and eating behavior among large proportion of the young population.

This kind of message identified individuals who were overweight as failures, who needed some sort of treatment, usually resulting in further failure. Controlling the weight is desirable, but not at the expense of unhealthy health behaviors like: starvation, vomiting, laxative abuse, diuretic and slimming pill usage, and cigarette smoking. These practices may be stimulated by incorrect understanding of health programs and media reports. The author point to the risk of transference of the teacher’s own beliefs and attitudes – usually ill-informed – to the children (O’Dea, 2004).

O’Dea (2004) suggests that all health education materials should be pre-tested in order to identify how the messages are perceived among the target audience. The campaigns should never blame the victim. “Health at every size” movements are helping health professionals and overweight people to focus on health improvements, instead of weight. Puhl and Latner (2007) add that interventions should focus on health as the primary motivator and desired outcome for positive lifestyle behavior, instead of focusing on weight or thinness.

Articles presented in section 2.1 indicated that there is an intense discrimination against obese and very thin individuals in western societies, Brazil included. Studies cited in section 2.2 point to several cautions that have to be considered when implementing public campaigns directed to reduce obesity, so that the discriminations and reduction of self-esteem of obese individuals are not further intensified.

3 DESCRIPTION OF PENSE

Database used in this study derives from PeNSE 2012, a survey conducted by the Brazilian Institute of Geography and Statistics (IBGE) in partnership with the Ministry of Health. PeNSE covers a broad range of subjects, including demographical information, eating behavior, body image, physical exercise, consumption of cigarettes, alcohol and other drugs, dental health, sexual behavior, protection network, violence and accidents. The study also investigates the infrastructure of the schools.

The first edition of the survey happened in 2009. The target of PeNSE was the 9th year students of elementary schools with 15 pupils or more. The base cadaster for the sample was the School Census 2010, realized by the National Institute of Educational Studies and Researches Anísio Teixeira (INEP). Only day-schools were considered.

Each of the 26 State capitals and the Federal District were considered as geographical strata. The remaining cities were grouped in each of the five Great Regions to which they belong, forming five geographical strata. For each of the 27 first strata, a sample of schools was made. These schools were visited and their 9th year classes listed. A sample of classes of each school was selected, and their students invited to take part in the survey. For the remaining strata, the cities were grouped following criteria of homogeneity and proximity, resulting in clusters of 300 to 600 classes. These groups were sampled in each region, and their schools and students were interviewed.

From a total of 132,123 students in the sample, 110,873 were present in the date of the data collection – that was made through questionnaires installed in smartphones. 109,104 students responded the survey.

Among the studies that were based on PeNSE 2009, the following can be cited. Araújo *et al.* (2010) found out that 23% of the students were overweight, and 7.3% obese. This situation was more frequent in the South and Southeast regions, in private schools, and in wealthier families. Deficits in height and weight were more prevalent in public schools.

Castro *et al.* (2010) examined the agreement between body image (BI) and nutritional status (NS). Results indicate that there is a low agreement. Almost half of

the students that were overweight considered themselves as having a normal weight, while 27% thought they were thin.

Malta *et al.* (2010) analyzed the prevalence of protective and risk behaviors of the students. Results indicated that 62.6% consumed beans, 31.5% fruits, 58.3% sweets and 37% soft drinks. 43.1% exercised at least 300 minutes per week. Hallal *et al.* (2010) detailed that the proportion of active boys (56.2%) was higher than that of the girls (31.3%).

4 RESULTS

PeNSE has a question in which students classify themselves as “very thin”, “thin”, “normal”, “fat” and “very fat”. Throughout this article, quotation marks will be maintained to emphasize this self-classification. This is the main classification variable used in this study.⁵

Three reasons justify this decision. First, in 2009, height and weight were collected by trained interviewers of IBGE. In 2012, these variables were self-reported by the students. These measures are not only subject to measurement error, but there were also several missing values and unreliable answers.

Second, for individuals under 19 years old, there are no straight categories for body mass index as there are for adults (underweight, normal, overweight, obesity class I, obesity class II, obesity class III). Boys and girls are classified according to percentiles, what generates analytical difficulties.

Third, the perceived body image may be more important to the current analysis than the objective nutritional status. If a student sees himself as obese and/or is treated like that by the peers, this can be more relevant than the objective classification based on BMI, when one wants to investigate the discrimination.⁶

5. For further details, see annex 1.

6. “The difference between a subject’s desired body weight and his or her actual body weight (a measure that captures the psychological dimensions of obesity) is a much more powerful predictor of morbidity than is BMI” (Muennig, 2008, p. 3).

4. 1 Descriptive statistics

Table 1 presents the percentages of occurrence of risk behaviors, bullying, aggressions and injuries, physical activity and relation with parents, among 9th year elementary school male students.

TABLE 1
Percentage of 9th year elementary school male students according to selected variables by perceived body image – Brazil (2012)

Variables	Very thin	Thin	Normal	Fat	Very fat
Bullying ¹	42.6	40.1	33.2	49.9	63.8
Frequent bullying ¹	11.3	8.6	6.5	12.1	23.7
Bullying body appearance ²	17.1	11.8	7.4	36.5	49.6
Active bullying ¹	33.0	27.1	24.7	29.0	39.4
Vomit / Laxative ¹	19.9	5.0	4.9	5.7	21.3
Drug/formula lose weight ¹	21.2	6.8	5.7	5.9	17.3
Drug/formula gain weight ¹	23.1	10.0	7.7	4.8	12.7
Frequent loneliness ³	19.2	11.6	8.9	15.1	32.5
Insomnia ³	10.9	6.2	5.8	7.1	15.5
Cigarette ¹	8.7	5.2	4.9	5.0	14.9
Alcohol problems ⁴	14.2	10.0	9.2	9.3	16.7
Alcohol ¹	29.6	24.2	25.5	24.8	39.0
Illicit drugs ¹	5.7	3.0	2.8	2.4	10.2
Family violence ¹	17.4	10.4	8.8	12.0	24.3
Non comprehensive parentes ¹	45.5	32.3	28.3	30.0	47.4
Victim of aggression ³	22.3	17.9	15.0	21.9	38.1
Fight ³	25.8	26.3	27.4	30.2	38.7
Injury ³	16.1	13.0	11.6	11.2	23.3
Sedentary ⁵	21.8	15.9	12.6	18.6	26.2
Active ⁵	23.7	25.4	29.8	22.6	22.3
Number of students	51,242	281,517	970,911	183,088	13,601

Source: Prepared by author using PeNSE 2012 (IBGE) microdata.

Notes: ¹ Last 30 days

² Of those who suffered bullying

³ Last 12 months

⁴ During lifetime

⁵ Last 7 days

Obs.: See description of variable construction in Annex 1.

Data indicate that students that classify themselves as “very fat” are much more prone to risk behaviors like consumption of illicit drugs, alcohol, cigarettes and laxatives (or vomit inducing), when compared to “normal” pupils. They are also much more likely to suffer from frequent bullying (23.7%), especially that motivated by their body appearance (49.6% of those who suffered this kind of discrimination), to be active bullies (39.4%, probably as a defense mechanism), to feel frequently lonely (32.5%), to suffer from insomnia (15.5%), family violence (24.3%), aggressions (38.1%), injuries (23.3%). 38.7% were involved in fights. Almost half of them (47.4%) feel that their parents or tutors rarely or never understand their problems and preoccupations. There is a great percentage of sedentary students (26.2%), but there are also 22.3% of them that exercise at least one hour per day, five days of the week.

Results are not so critical for students that classify themselves as “fat”, when compared to “very fat” pupils. Only 12.1% suffered from frequent bullying and for those victims of this kind of discrimination, body appearance was the motivation for 36.5%. 29% are active bullies, a percentage very close to that observed by “thin” students. Frequent loneliness, insomnia, family violence, aggressions, injuries and fights occurred for 15.1%, 7.1%, 12%, 21.9%, 11.2% and 30.2% of the “fat” students, respectively. 18.6% are sedentary (less than “very thin” students), and 22.6% are physically active.

“Very thin” male students have several figures that are worse than those of “fat” students: active bullies (33%), use of laxatives or vomit inducing (19.9%), frequent loneliness (19.2%), insomnia (10.9%), consumption of alcohol (29.6%) and illicit drugs (5.7%), family violence (17.4%), non-comprehensive parents (45.5%), aggressions (22.3%) and injuries (16.1%). The consumption of drugs or formulas to lose (21.2%) or gain weight (23.1%) is the largest one. Figures are overall more favorable for “thin” and “normal” students.

It can be noticed that the consumption of illegal drugs present relatively low figures, while the use of drugs to gain or lose weight and laxatives or vomit inducing can much higher proportions among “very thin” and “very fat” students.

Figures for female students, presented in Table 2, have similarities and differences when compared to the male pupils. One of the similarity is that “very fat” girls have

overall worse indicators for most of the variables. The other one is that several figures are worse for the “very thin” than for the “fat”.

Differences include: lower percentages of active bullies, fighters, injured and physically active, lower consumption of illicit drugs and formulas to lose or gain weight, higher levels of frequent lonely and sedentary students. Insomnia percentages are also higher. The other major difference is that “very thin” girls are more prone to being victims of bullying than their “fat” peers.

Of the “very fat” girls, 17% suffered from frequent bullying and for those victims of this kind of discrimination, body appearance was the motivation for 48.2%. Only 18.4% are active bullies, a percentage smaller than that observed by “very thin” students. Frequent loneliness, insomnia, family violence, aggressions, injuries and fights occurred for 50%, 26.5%, 20.8%, 23.9%, 14.9% and 21.4% of the “very fat” students, respectively. 36.1% are sedentary (less than “very thin” students), and 13.7% are physically active.

“Very thin” girl students have several figures worse than those for “fat” students: active bullies (20.4%), frequent loneliness (34.4%), insomnia (21.2%), consumption of alcohol (27.3%) and illicit drugs (2.3%), family violence (17.5%), non-comprehensive parents (46.8%), aggressions (22.5%) and injuries (13.4%). Figures are overall more favorable for “thin” and “normal” students.

TABLE 2
Percentage of 9th year elementary school female students according to selected variables by perceived body image – Brazil (2012)

Variables	Very thin	Thin	Normal	Fat	Very fat
Bullying ¹	47.5	36.2	30.1	40.2	53.6
Frequent bullying ¹	12.6	6.0	5.4	8.0	17.0
Bullying body appearance ^{1,2}	29.8	19.5	7.9	27.7	48.2
Active bullying ¹	20.4	16.1	15.2	17.1	18.4
Vomit / Laxative ¹	7.6	2.8	5.0	12.3	25.2
Drug/formula lose weight ¹	8.0	3.6	3.8	8.4	15.1
Drug/formula gain weight ¹	11.3	6.4	3.3	2.8	4.9
Frequent loneliness ³	34.4	20.5	17.7	30.3	50.0
Insomnia ³	21.2	12.4	11.0	15.4	26.5

(Continues)

(Continued)

Variables	Very thin	Thin	Normal	Fat	Very fat
Cigarette ¹	5.0	4.2	5.0	5.7	10.0
Alcohol problems ⁴	13.9	10.4	10.0	11.1	15.6
Alcohol ¹	27.3	25.8	26.6	28.7	32.1
Illicit drugs ¹	2.3	2.1	2.0	2.1	4.3
Family violence ¹	17.5	11.4	10.3	13.8	20.8
Non comprehensive parentes ¹	46.8	35.8	30.9	39.0	47.5
Victim of aggression ³	22.5	16.2	13.6	18.2	23.9
Fight ³	19.2	14.3	13.8	16.5	21.4
Injury ³	13.4	9.0	8.4	9.5	14.9
Sedentary ⁵	37.2	37.0	31.8	36.7	36.1
Active ⁵	12.8	11.7	13.6	12.6	13.7
Number of students	68,647	285,300	971,424	282,593	31,102

Source: Prepared by author using PeNSE 2012 (IBGE) microdata.

Notes: ¹ Last 30 days

² Of those who suffered bullying

³ Last 12 months

⁴ During lifetime

⁵ Last 7 days

Obs.: See description of variable construction in Annex 1.

Figures for public and private schools have very similar patterns, as can be seen in Tables 3 and 4. Occurrence of bullying is higher in private schools, where the prevalence of sedentary students is lower. Percentage of students practicing vomit inducing or using laxatives, and consuming cigarettes is higher in public schools.

TABLE 3

Percentage of 9th year elementary public school students according to selected variables by perceived body image – Brazil (2012)

Variables	Very thin	Thin	Normal	Fat	Very fat
Bullying ¹	44.8	37.8	30.9	42.8	54.1
Frequent bullying ¹	12.1	7.4	5.9	9.2	19.4
Bullying body appearance ^{1,2}	24.7	15.8	7.6	33.3	48.7
Active bullying ¹	26.1	21.2	19.3	21.1	23.8
Vomit / Laxative ¹	14.6	4.2	5.1	10.1	24.3
Drug/formula lose weight ¹	15.0	5.3	4.9	7.6	15.0

(Continues)

(Continued)

Variables	Very thin	Thin	Normal	Fat	Very fat
Drug/formula gain weight ¹	17.5	8.5	5.6	3.9	7.6
Frequent loneliness ³	28.5	16.4	13.4	24.6	42.6
Insomnia ³	17.1	9.2	8.5	12.3	23.3
Cigarette ¹	7.3	5.2	5.3	6.1	12.3
Alcohol problems ⁴	15.7	10.6	9.8	11.2	16.7
Alcohol ¹	29.3	26.0	26.5	28.3	34.8
Drugs ¹	3.8	2.7	2.4	2.2	5.8
Family violence ¹	18.6	11.2	9.6	13.7	22.8
Non comprehensive parentes ¹	47.2	34.6	29.9	36.0	45.8
Victim of aggression ³	22.8	16.9	14.0	19.2	26.7
Fight ³	22.8	20.5	20.4	21.3	26.7
Injury ³	16.0	11.5	10.2	10.5	16.4
Sedentary ⁵	31.2	27.1	22.7	30.8	33.7
Active ⁵	17.5	17.8	21.3	16.1	15.8
Number of students	99,803	470,677	1,641,883	354,977	32,644

Source: Prepared by author using PeNSE 2012 (IBGE) microdata.

Notes: ¹ Last 30 days² Of those who suffered bullying³ Last 12 months⁴ During lifetime⁵ Last 7 days

Obs.: See description of variable construction in Annex 1.

TABLE 4

Percentage of 9th year elementary private school students according to selected variables by perceived body image – Brazil (2012)

Variables	Very thin	Thin	Normal	Fat	Very fat
Bullying ¹	48.4	39.6	35.6	47.9	63.8
Frequent bullying ¹	12.0	6.5	6.1	10.7	17.8
Bullying body appearance ^{1,2}	24.8	14.0	8.0	26.8	48.6
Active bullying ¹	24.2	23.4	23.3	23.8	27.5
Vomit / Laxative ¹	4.5	2.3	3.8	8.4	23.4
Drug lose weight ¹	6.8	4.3	3.8	6.8	17.7
Drug gain weight ¹	10.5	6.6	5.1	2.7	6.6
Frequent loneliness ³	24.7	14.3	12.7	23.5	50.3
Insomnia ³	15.0	9.8	7.9	11.5	22.6

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Variables	Very thin	Thin	Normal	Fat	Very fat
Cigarette ¹	2.9	2.2	3.0	3.4	9.3
Alcohol problems ⁴	6.0	8.3	8.7	7.9	13.7
Alcohol ¹	23.3	20.3	23.2	23.7	32.6
Drugs ¹	3.3	1.8	2.2	2.0	6.8
Family violence ¹	12.1	9.2	9.1	11.3	19.6
Non comprehensive parentes ¹	41.1	31.4	28.6	33.6	52.3
Victim of aggression ³	20.4	17.9	15.9	21.4	32.2
Fight ³	18.0	19.1	21.8	23.7	26.6
Injury ³	7.2	8.8	8.6	9.0	20.3
Sedentary ⁵	27.5	23.7	19.7	25.8	31.5
Active ⁵	16.9	21.7	23.8	18.4	17.8
Number of students	20,087	96,140	300,452	110,705	12,059

Source: Prepared by author using PeNSE 2012 (IBGE) microdata.

Notes: ¹ Last 30 days

² Of those who suffered bullying

³ Last 12 months

⁴ During lifetime

⁵ Last 7 days

Obs.: See description of variable construction in Annex 1.

There is no information in PeNSE about the quantity of foods consumed by the students. But there is data about the number of days that some foods were consumed in the last 7 days. Table 5 shows, on the one hand, that “very fat” students consumed healthy food like beans and milk fewer days than “normal” pupils. On the other hand, averages for unhealthy foods like fritter, sausages, salty and sweet biscuits, snacks and soda were lower. And averages for legumes, salads, cooked legumes and fruits are similar or higher for “very fat” students, while compared with “normal” pupils. Overall, figures suggest that “very fat” students are food conscious, and, at least in terms of frequency (not necessarily in quantities), show an effort to have a healthier diet than their peers.

TABLE 5
Average of days when selected foods were consumed by 9th year elementary school students during last 7 days, by perceived body image – Brazil (2012)

Food	Very thin	Thin	Normal	Fat	Very fat
Beans	5.0	5.4	5.4	4.9	4.7
Fritter	2.5	2.3	2.2	2.0	2.1
Sausages	2.3	2.3	2.1	2.0	2.0
Legumes	2.8	3.2	3.3	3.3	3.6
Salads	2.3	2.5	2.7	2.7	3.0
Cooked legumes	1.8	1.7	1.9	1.7	1.9
Salty biscuits	3.6	3.7	3.5	2.9	3.0
Sweet biscuits	3.4	3.5	3.3	2.8	2.9
Snacks	1.9	1.9	1.8	1.4	1.6
Candies	3.9	4.0	3.7	3.6	3.8
Fruits	2.7	2.9	3.1	2.9	3.0
Milk	4.0	4.2	4.2	4.0	3.8
Soda	3.5	3.5	3.4	3.0	3.1
Number of students (thousands)	119	566	1,941	465	44

Source: Prepared by author using PeNSE 2012 (IBGE) microdata.

4.2 Model

Even though descriptive statistics show an interesting picture, it is important to test the effect of the body image on discrimination controlling for selected variables. In order to do that, the following logit model was estimated:

$$\ln(P_i / 1 - P_i) = \alpha + \beta_1 \text{BodyImage}_i + \beta_2 \text{Sex}_i + \beta_3 \text{Colour}_i + \beta_4 \text{Age}_i + \beta_5 \text{Pubpriv}_i + \beta_6 \text{MSchool}_i + \beta_7 \text{Stratogeo}_i = u_i \quad (1)$$

where:

P is the probability of being frequently bullied.

BodyImage indicates if the students classify him or herself as “very thin”, “thin”, “normal”, “very fat”, “fat”, “normal” as reference.

Sex indicates the sex of the student, female as reference.

Colour stands for the colour or race⁷ of the student, white as reference.

Age is a categorical variable varying from 11 or less years to 18 years,⁸ 14 years old as reference.

Pubpriv is a categorical variable that indicates if the school is private or public, public as reference.

MSchool is a categorical variable that indicates the schooling of the mother of the student, high school degree as reference.

Stratogeo is a categorical variable that indicates the sample strata,⁹ a control for the city where the student lives, city of São Paulo as reference.

u is the error term.

i is a subscript indicating the i_{th} observation.

As there is no variable in PeNSE indicating economic class or socioeconomic status, schooling of the mother was introduced as a proxy. All observations that had missing values for the selected variables were excluded. This resulted in a database of 89,320 observations (2,528,274 with sample expansion). As PeNSE has a stratified sampling, the model was estimated with using SAS PROC SURVEYLOGISTIC.

The tests presented at Table 6 reject the null hypothesis that all of the predictors are simultaneously equal to zero. Table 7 shows that non “normal” students have a greater chance of suffering frequent bullying (FB) than “normal” pupils. Male students have greater chance of being frequently discriminated when compared to the female ones.

7. In Brazil ethnic questions are stated in this form, with the following options: white, black, yellow, mix-raced (pardo) and Indian. Pardo is a yellowish brown.

8. Observations in the last category – 19 years or more – were excluded from the regression. 14 year old students were selected as reference because they have the “typical” age for the 9th year.

9. See section 3 for more details.

Seventeen year old students have smaller chances of suffering FB than their 14 year old peers. There is no statistical difference between public and private schools.

Black, yellow and Indian students have greater chance of suffering FB than white pupils. There is no statistical difference between brown and white pupils. Students whose mothers didn't study have greater chance of suffering frequent bullying than those whose mothers have high school degree.

TABLE 6
Testing global null hypothesis: $BETA=0$

Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	24901.3208	54	<0.0001
Score	27438.4355	54	<0.0001
Wald	445.8785	54	<0.0001

Source: Prepared by author using PeNSE 2012 (IBGE) microdata.

TABLE 7
Analysis of maximum likelihood estimates

Parameter		DF	Estimate	Standard error	Wald Chi-Square	Pr > ChiSq
Intercept		1	-2.9137	0.1135	658.9050	<0.0001
Body image	Very thin	1	0.7994	0.0940	72.2816	<0.0001
Body image	Thin	1	0.2443	0.0578	17.8824	<0.0001
Body image	Fat	1	0.5354	0.0575	86.8311	<0.0001
Body image	Very fat	1	1.3090	0.1199	119.2123	<0.0001
Sex	Male	1	0.2877	0.0444	42.0457	<0.0001
Colour/Race	Black	1	0.1803	0.0694	6.7443	0.0094
Colour/Race	Yellow	1	0.2927	0.1036	7.9822	0.0047
Colour/Race	Brown	1	0.000609	0.0519	0.0001	0.9906
Colour/Race	Indian	1	0.2266	0.1142	3.9349	0.0473
Age	11 or less	1	0.6725	0.7334	0.8409	0.3591
Age	12	1	0.4314	0.2277	3.5889	0.0582
Age	13	1	0.1037	0.0558	3.4529	0.0631
Age	15	1	-0.1137	0.0603	3.5567	0.0593
Age	16	1	-0.1128	0.0836	1.8201	0.1773
Age	17	1	-0.2859	0.1276	5.0232	0.0250

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Parameter		DF	Estimate	Standard error	Wald Chi-Square	Pr > ChiSq
Age	18	1	0.0568	0.2010	0.0799	0.7775
Pubpriv	Private	1	-0.00194	0.0665	0.0008	0.9768
Mother schooling	Didn't study	1	0.2076	0.0815	6.4934	0.0108
Mother schooling	Elementary incomplete	1	-0.0528	0.0606	0.7616	0.3828
Mother schooling	Elementary	1	-0.0186	0.0844	0.0483	0.8260
Mother schooling	High School incomplete	1	0.0140	0.0846	0.0274	0.8685
Mother schooling	Higher education incomplete	1	-0.0152	0.1055	0.0208	0.8853
Mother schooling	Higher education	1	-0.0672	0.0785	0.7325	0.3921

Source: Prepared by author using PeNSE 2012 (IBGE) microdata.

Note: ESTRATOGEO estimates were not displayed for parsimony. See Annex 2 for the complete model.

To have a clearer understanding of the differences in the occurrence of frequent bullying, it is useful to calculate the probabilities for typical cases. As the results of the model are in log of odds ratios, it is necessary to apply transformations to compute the probabilities (Menard, 2001):

$$P(Y = 1) = \frac{e^{(\alpha + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k)}}{1 + e^{(\alpha + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k)}}$$

Considering white female students from the city of São Paulo, whose mother had elementary school education, that were 14 years old and attended public school, probabilities of being victim of frequently bullying are: “very thin” (0.108), “thin” (0.065), “normal” (0.051), “fat” (0.085) and “very fat” (0.167). For male students, other variables equal: “very thin” (0.122), “thin” (0.074), “normal” (0.059), “fat” (0.097) and “very fat” (0.188). For both cases, it can be noticed that the probability of “very thin” students suffering frequent bullying is at least two times higher than that for “normal” pupils. And the probability for “very fat” students is about three times higher than “normal” pupils.

5 DISCUSSION AND CONCLUDING REMARKS

First of all, it is important to state that even though PeNSE is statistically representative of 9th year Brazilian students, it is more than reasonable to expect that the discrimination shown by the survey also occurs in earlier and later school years.

Descriptive statistics indicate that “very fat” boys and girls have overall worse indicators for most of the risk behavior and other variables analyzed. Several figures are worse for the “very thin” than for the “fat” students. Comparing girls and boys, there are lower percentages of active bullies, fighters, injured and physically active, lower consumption of illicit drugs and formulas to lose or gain weight, higher levels of frequent lonely and sedentary female students. Insomnia percentages are also higher for the girls. “Very thin” girls are more prone to being victims of bullying than their “fat” peers, while the opposite occurs for the male students.

Figures for public and private schools have very similar patterns. Occurrence of bullying is slightly higher in private schools and the prevalence of sedentary students is lower. Percentages of students vomit inducing or using laxatives, and consuming cigarettes are higher in public schools. Figures also suggest that “very fat” students are food conscious, and, at least in terms of frequency (not necessarily in quantities), show an effort to have a healthier diet than their peers.

These statistics suggest the occurrence of a complex and recursive phenomenon, where students that have a less harmonious relationship with their parents have lower self-esteem and also more problems with their peers. It also can be noticed that the consumption of illegal drugs present relatively low figures, while the use of drugs to gain or lose weight, laxatives or vomit inducing can much higher proportions among “very thin” and “very fat” students.

Econometric model shows that non “normal” students have a greater chance of suffering frequent bullying than “normal” pupils. Male students have greater chance of being frequently discriminated when compared to the female ones. Seventeen year old students have smaller chances of suffering FB than their 14 year old peers. There is no statistical difference between public and private schools.

Black, yellow and Indian students have greater chance of suffering FB than white pupils. This result shows that minorities have greater chance of suffering discrimination than majorities. PeNSE 2012 data shows that there are 42.2% of mix-raced (pardos), 36.8% of whites, 13.4% of blacks, 4.1% of yellows and 3.5% of Indians (IBGE, 2013). Students whose mothers didn't study have greater chance of suffering frequent bullying than those whose mothers have high school degree.

Several public policy concerns arise from the results. First, discrimination based on body image should be included in the radar of both the Ministries of Health and Education. Second, the use of drugs, formulas and other products to lose or gain weight, laxatives and vomit inducing should be considered as object of public health policies. Third, public campaigns should be promoted to diminish discrimination. However, these campaigns and also those devoted to promote healthier eating and physical exercise should be tested to prevent stigmatization of obese and very thin individuals. Fourth, practice of physical exercise should be further promoted among students, especially the female ones.

Suggestions for future research might include: evaluation of discrimination against fat and very thin students among education and health professionals; analysis of the impact of discrimination on the educational performance of students.

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ANNEX 1

Description of variables used in section 4.1

Variables	Code	Question	Criteria of selection of students
Bullying	B07007	During last 30 days how frequently did the student's peers made verbal offenses that made (s)he feel humiliated?	Every student that informed at least one episode
Frequent bullying	B07007	During last 30 days how frequently did the student's peers made verbal offenses that made (s)he feel humiliated?	Students that informed "most of the time" or "always"
Bullying body appearance	B07008	Reason for the verbal offenses	Students that suffered bullying and informed "the appearance of my body"
Active bullying	B07009	During last 30 days did the student humiliated verbally a peer?	Students that informed "yes"
Vomit / Laxative	B11003	During last 30 days did the student vomit or consumed laxative to lose or avoid gaining weight?	Students that informed "yes"
Drug/formula lose weight	B11004	During last 30 days did the student take a drug, formula or other product to lose or maintain weight, without medical supervision?	Students that informed "yes"
Drug/formula gain weight	B11005	During last 30 days did the student take a drug, formula or other product to gain weight or muscle tissue, without medical supervision?	Students that informed "yes"
Frequent loneliness	B12001	During last 12 months how frequently did the student feel lonely?	Students that informed "most of the time" or "always"
Insomnia	B12002	During last 12 months how frequently did the student could not feel asleep because something was worrying him or her so much?	Students that informed "most of the time" or "always"
Cigarette	B04003	During last 30 days, how many days did the student smoke a cigarette?	Students that did not inform "never smoked" or "zero"
Alcohol problems	B05009	During your lifetime, how many times did the student have problems with family or friends, skipped classes or fight because of alcohol consumption?	Every student that did not inform "never in my life"
Alcohol	B05004	During last 30 days, how many days did the student drink at least a glass or dose of alcohol?	Students that did not inform "zero"
Drugs	B06003	During last 30 days, how many times did the student consumed marijuana, cocaine, crack, loló, lança-perfume, ecstasy, oxy etc.?	Students that did not inform "never took drugs" or "zero"
Family violence	B09003	During last 30 days how many times did you suffer a physical aggression by an adult of the family?	Every student that informed at least one episode
Non comprehensive parents	B07004	During last 30 days how frequently did the student's parents or tutors understand his or her problems and concerns?	Students that informed "never" or "rarely"

(Continues)

Variables	Code	Question	Criteria of selection of students
Victim of aggression	B09010	During last 30 days how many times was the student physically attacked?	Every student that informed at least one episode
Fight	B09011	During last 30 days how many times was the student involved in a fight?	Every student that informed at least one episode
Injury	B09012	During last 30 days how many times was the student seriously injured?	Every student that informed at least one episode
Sedentary	B03011	During last 7 days how many days did the student exercised at least 60 minutes a day?	Students that informed "zero"
Active	B03011	During last 7 days how many days did the student exercised at least 60 minutes a day?	Students that informed "five", "six" or "seven" days
Number of students			Frequency of students considering sample weight

Source: Prepared by author using PeVSe 2012 (IBGE) microdata

Obs.: Missing values were not excluded, as they were residual.

ANNEX 2

Analysis of maximum likelihood estimates (complete model)

Parameter		DF	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
Intercept		1	-2.9137	0.1135	658.9050	<0.0001
Body image	Very thin	1	0.7994	0.0940	72.2816	<0.0001
Body image	Thin	1	0.2443	0.0578	17.8824	<0.0001
Body image	Fat	1	0.5354	0.0575	86.8311	<0.0001
Body image	Very fat	1	1.3090	0.1199	119.2123	<0.0001
Sex	Male	1	0.2877	0.0444	42.0457	<0.0001
Colour/Race	Black	1	0.1803	0.0694	6.7443	0.0094
Colour/Race	Yellow	1	0.2927	0.1036	7.9822	0.0047
Colour/Race	Brown	1	0.000609	0.0519	0.0001	0.9906
Colour/Race	Indian	1	0.2266	0.1142	3.9349	0.0473
Age	11 or less	1	0.6725	0.7334	0.8409	0.3591
Age	12	1	0.4314	0.2277	3.5889	0.0582
Age	13	1	0.1037	0.0558	3.4529	0.0631
Age	15	1	-0.1137	0.0603	3.5567	0.0593
Age	16	1	-0.1128	0.0836	1.8201	0.1773
Age	17	1	-0.2859	0.1276	5.0232	0.0250
Age	18	1	0.0568	0.2010	0.0799	0.7775
Pubpriv	Private	1	-0.00194	0.0665	0.0008	0.9768
Mother schooling	Didn't study	1	0.2076	0.0815	6.4934	0.0108
Mother schooling	Elementary incomplete	1	-0.0528	0.0606	0.7616	0.3828
Mother schooling	Elementary	1	-0.0186	0.0844	0.0483	0.8260
Mother schooling	High School incomplete	1	0.0140	0.0846	0.0274	0.8685
Mother schooling	Higher education incomplete	1	-0.0152	0.1055	0.0208	0.8853
Mother schooling	Higher education	1	-0.0672	0.0785	0.7325	0.3921
Estratogeo	Cities not capital of North region	1	-0.1846	0.1088	2.8793	0.0897
Estratogeo	Cities not capital of Northeast region	1	-0.1903	0.1070	3.1619	0.0754
Estratogeo	Cities not capital of Southeast region	1	0.0512	0.1036	0.2448	0.6208
Estratogeo	Cities not capital of South region	1	0.1038	0.1044	0.9901	0.3197
Estratogeo	Cities not capital of Center West region	1	-0.1252	0.1061	1.3921	0.2380
Estratogeo	Porto Velho	1	-0.3825	0.1477	6.7037	0.0096
Estratogeo	Rio Branco	1	0.0728	0.1358	0.2874	0.5919
Estratogeo	Manaus	1	-0.4552	0.1514	9.0471	0.0026
Estratogeo	Boa Vista	1	-0.0106	0.1371	0.0060	0.9384
Estratogeo	Belém	1	-0.4428	0.1535	8.3185	0.0039
Estratogeo	Macapá	1	-0.0964	0.1341	0.5169	0.4722
Estratogeo	Palmas	1	-0.1106	0.1455	0.5770	0.4475
Estratogeo	São Luís	1	-0.3826	0.1352	8.0079	0.0047

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Parameter		DF	Estimate	Standard error	Wald Chi-Square	Pr > ChiSq
Estratogeo	Teresina	1	-0.4664	0.1424	10.7323	0.0011
Estratogeo	Fortaleza	1	-0.1758	0.1380	1.6228	0.2027
Estratogeo	Natal	1	-0.1316	0.1377	0.9142	0.3390
Estratogeo	João Pessoa	1	-0.1603	0.1293	1.5375	0.2150
Estratogeo	Recife	1	-0.1203	0.1245	0.9340	0.3338
Estratogeo	Maceió	1	-0.4589	0.1581	8.4252	0.0037
Estratogeo	Aracaju	1	-0.2598	0.1338	3.7703	0.0522
Estratogeo	Salvador	1	-0.1697	0.1409	1.4507	0.2284
Estratogeo	Belo Horizonte	1	0.0459	0.1261	0.1324	0.7160
Estratogeo	Vitória	1	0.1239	0.1281	0.9359	0.3333
Estratogeo	Rio	1	-0.1729	0.1380	1.5694	0.2103
Estratogeo	Curitiba	1	-0.0653	0.1324	0.2435	0.6217
Estratogeo	Florianópolis	1	-0.4830	0.1519	10.1089	0.0015
Estratogeo	Porto Alegre	1	-0.4934	0.1675	8.6815	0.0032
Estratogeo	Campo Grande	1	0.0196	0.1363	0.0206	0.8858
Estratogeo	Cuiabá	1	-0.3064	0.1531	4.0058	0.0453
Estratogeo	Goiânia	1	-0.1682	0.1255	1.7939	0.1805
Estratogeo	Brasília	1	-0.0752	0.1244	0.3652	0.5457

Source: Prepared by author using PeNSE 2012 (IBGE) microdata.

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