Objective: To determine the association between body image dissatisfaction (BID) and depressive symptoms in adolescents from a school in Lima, Peru.

Methods: A cross-sectional study was performed through a census of 875 high-school students, aged 13 to 17 years, from a school in Lima. Participants completed a survey containing the Body Shape Questionnaire (BSQ) and the Patient Health Questionnaire-9 (PHQ-9). Data regarding demographics, alcohol and tobacco use, self-esteem, and family history of depression were also obtained. To identify associated factors, Poisson regression with robust variance was used. Prevalence ratios with 95% confidence intervals were calculated.

Results: Of the 875 adolescents, 55.8% were male. The mean age was 14.1 ± 1.5 years. Depressive symptoms were observed in 19.9% of participants. An association between BID and depressive symptoms was found. Alcohol and tobacco use were also associated with the outcome of interest.

Conclusions: Teens who had BID were 3.7 times more likely to report depressive symptoms. Additionally, those who used tobacco or alcohol were 1.5 and 1.4 times more likely to have depressive symptoms, respectively. Further studies targeting other populations and using longitudinal designs are recommended.

Keywords: Adolescents; body image; depression

Introduction

Depression is a public health problem that is present in 10-20% of the general population, according to the World Health Organization (WHO), and is considered the main cause of disability worldwide. In Peru, the prevalence is similar at 10-20% overall and approximately 18% in Metropolitan Lima.

The DSM-5 defines depression as “a depressed mood or loss of interest or pleasure in nearly all activities for a period of at least 2 weeks, considering that children and adolescents may be irritable instead of sad.” It is characterized by an episodic course with high rates of recurrence (35% in 2 years and 60% in 12 years).

The relevance of this issue is that depression is associated with various potentially preventable public health problems, such as deterioration in personal and/or social functioning, substance abuse (alcohol and tobacco), and suicide.

Several factors have been associated with the development of depressive symptoms in adolescents. Female sex and age have been found to be particularly important, and some studies showed that alcohol and tobacco use are risk factors for depressive symptoms.

According to research conducted in various countries, including the United States, Jamaica, and Spain, distorted body image could be a risk factor for developing depressive symptoms. Body image is defined as “a concept that one has of their own shape, size, body mass and parts.” Misperceptions can have a great impact on adolescents due to the extreme measures they might then take in pursuit of the “ideal image.”

Studies have shown that most teenagers have a distorted image of themselves. In a cross-sectional study by Santana et al. of 1,494 adolescents aged 11 to 17 in Salvador, state of Bahia, Brazil, own body dissatisfaction was reported by 19.5% of participants, and was more prevalent in girls (26.6%) than boys (10%).

In 2014, a Spanish study by Ferreiro et al. found that teens who had body image dissatisfaction (BID) were at increased risk of depressive symptoms. Another study, conducted in 2014 by Blow et al. in a sample of 160 Hispanic college students in Texas, found the same association.

On the other hand, a study conducted in Brazil by Fortes et al. in 2015 on 407 young people showed no association between these variables.

It is important to know the difference between self-esteem and body image, as the two concepts might be confused. Self-esteem, according to Mann, is defined as “the evaluative and affective dimension of self-concept and is considered an equivalent to self-regard and self-worth.” Contrariwise, body image is based on a biopsychosocial construct, i.e., the image that society, peers, and oneself has according to their ideal body image.

WHO has proposed that adolescents are a vulnerable population. In reviewing the literature, we found studies linking low self-esteem with depression in adolescents; however, no investigations conducted in Latin American countries (except Brazil) have assessed whether depression is associated with body image in this age group.
The present study aims to determine whether an association exists between BID and depressive symptoms in high school students. Secondary aims were to determine the prevalence of depressive symptoms in this population and whether depressive symptoms are associated with lifetime alcohol and tobacco use.

Materials and methods

Design, sample population, and study site

From October 24 to 27, 2014, we conducted a cross-sectional study of all students enrolled for the 2014 school year in a private high school in Ate, Lima.

We excluded students who did not attend on the day of the surveys, students who did not return a consent form signed by their parents, and those who refused to answer the survey. The final sample comprised 875 students, and the response rate was 95.2% (Figure 1).

Sample size was calculated in Epidat 4.0 software. On the basis of data from previous studies, a minimum sample size of 600 was established. Population 1 was the estimated proportion of people who had BID and depressive symptoms (30%) and population 2 was the estimated proportion of people without BID and depressive symptoms (20%). Confidence level was set to 95% and a statistical power of 80% was considered.

Instruments

The questionnaire, a compendium of four previously validated instruments, was anonymous and self-administered. Tobacco and alcohol use were assessed using standardized questions from the Spanish version of the Youth Risk & Resiliency Survey Center for Disease Control (CDC). For this study, only lifetime use was considered.

Self-esteem was assessed using the Self-esteem Test for Teens, which consists of 21 questions, evaluated on a Likert-type scale, covering four domains: cognitions about yourself, cognition of competence, family relationship, and anger. This scale has no cutoff. The questionnaire has been validated for use in Spanish.

Body image was assessed with the 34-item Body Shape Questionnaire (BSQ), scored on a Likert-type scale, which has also been validated for use in Spanish. BID was considered if the score was higher than 105 points.

Depressive symptoms were measured with the 14-item Patient Health Questionnaire (PHQ-9), validated in Spanish. Nine questions defined the score to determine whether depressive clinical features were present; a score \( \geq 10 \) points was considered positive. This instrument is based on the DSM-IV.

The questionnaire also collected demographic variables such as age, grade, sex (male/female), and history of depression in first-degree relatives.

Procedures

After approval of the research project by the Ethics Committee of the Universidad Peruana de Ciencias Aplicadas School of Health Sciences and the school authorities, the investigators went to the school as scheduled. First, lists of students from all secondary levels, stratified by grade and section, were obtained. Informed consent forms were sent in sealed envelopes to students’ parents, and informed assent was obtained from the students before administration of the survey.

Data collection was performed on two days. On day one, first-, second-, and third-grade students were evaluated, while on day two, fourth- and fifth-graders were assessed. An investigator remained in each classroom to clear up any doubts from the students. The survey took approximately 15 to 25 minutes to complete.

Statistical analysis

Survey data were entered into a Microsoft Excel 2007 database by the double entry method. Statistical analyses were performed in STATA version 11.0.
Measures of central tendency and dispersion (for quantitative variables) and proportions (for categorical variables) were calculated. A t-test and chi-square test were used for bivariate analysis, and assumptions were verified. P-values < 0.05 were considered significant. Reliability was assessed using Cronbach’s alpha for the self-esteem, BSQ, and PHQ-9 scales. Likewise, for the self-esteem scale, exploratory factor analysis with the principal components method was performed.

For multivariable analysis, we used Poisson regression with robust variance to model association between depressive symptoms and independent variables; the latter were included in the model if p < 0.2 on bivariate analysis. Adjustments could not be applied to all factors of self-esteem at the same time because of collinearity between them. Crude and adjusted analyses were performed, reporting prevalence ratios (PR) and 95% confidence intervals (95%CI).

Ethical aspects

As mentioned, this study was approved by the Ethics Committee of the Universidad Peruana de Ciencias Aplicadas School of Health Sciences. In addition, permission to conduct the study was obtained from school authorities. Participants’ parents were informed in advance of the study’s objectives, and only those participants who assented and whose parents had signed informed consent forms were included and surveyed.

Results

Population characteristics

In 2014, 919 students were enrolled in the school in which the study was conducted. The overall non-response rate was 4.8% (n=44); 21 students completed the surveys incorrectly, 15 were absent on the days of data collection, and eight refused to take the survey. Thus, the final sample size was 875 (55.8% male). The mean age was 14.1 ± 1.5 years (range: 11 to 17 years).

Overall, 19.9% of participants had depressive symptoms and 11.3% had BID. Lifetime prevalence of alcohol and tobacco use was 60.3% and 25.1% respectively. Finally, 15.7% of participants had at least one family member diagnosed with depression (data not shown).

In general, we found associations between sex, tobacco use, alcohol use, family history of depression, the “cognition about yourself” domain of the Self Esteem Test for Adolescents, and family relationship with BID (p < 0.05) (Table 1). We did not find associations between the other variables and BID.

Table 1 General characteristics of high school students in a school in Lima, Peru, 2014

| Characteristics                | Body image dissatisfaction* |
|-------------------------------|-----------------------------|
|                               | Yes (n=90) | %     | No (n=770) | %     | p-value |
| Age (years), mean (SD)        | 14.3 (1.5) | 14.1 (0.5) | 0.17 |
| Sex                           |             | < 0.001 |
| Female                        | 62          | 68.8  | 295        | 41.8  |
| Male                          | 28          | 31.1  | 411        | 58.2  |
| Grade                         |             | 0.41  |
| First (12-13 years old)       | 13          | 14.4  | 159        | 22.5  |
| Second                        | 18          | 20.1  | 142        | 20.1  |
| Third                         | 30          | 22.2  | 153        | 21.9  |
| Fourth                        | 19          | 21.1  | 133        | 18.8  |
| Fifth (16-17 years old)       | 20          | 22.2  | 119        | 16.9  |
| Self-esteem z score, mean (SD)|             | < 0.001 |
| Cognition about yourself      | -1.1 (1.1)  | 0.2 (0.9) | 0.001 |
| Cognition of competence       | 0.1 (1.0)   | -2*10^-2 (1.0) | 0.18 |
| Anger                         | 0.1 (0.9)   | -3*10^-2 (1.0) | 0.29 |
| Family relationship           | 0.5 (1.3)   | -4*10^-2 (0.9) | < 0.001 |
| Tobacco use                   |             | 0.04  |
| Yes                           | 30          | 33.7  | 168        | 23.8  |
| No                            | 59          | 66.3  | 537        | 76.2  |
| Alcohol use                   |             | 0.006 |
| Yes                           | 66          | 73.3  | 408        | 58.4  |
| No                            | 24          | 26.7  | 291        | 41.6  |
| Family history of depression  |             | 0.02  |
| Yes                           | 21          | 23.3  | 101        | 14.3  |
| No                            | 69          | 76.7  | 605        | 85.7  |

SD = standard deviation.

*Defined as a Body Shape Questionnaire (BSQ) score ≥ 105 points.

1 Self self-esteem test for adolescents.

2 Lifetime prevalence.