



Original / *Obesidad*

## Beliefs, attitudes and phobias among Mexican medical and psychology students towards people with obesity

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### Abstract

**Background:** A high prevalence of stigmatizing attitude among healthcare personnel towards obese people has been reported.

**Objective:** To evaluate the beliefs, attitudes and phobias that Mexican medical and psychology students have towards obese people.

**Methods:** A cross-sectional study was conducted with 528 students enrolled at the Autonomous University of Baja California in psychology and medical schools. Weight, height and waist circumference were evaluated. Beliefs about obesity were assessed with the BAOP scale, attitudes towards obese people by the ATOP scale and obesity phobias by the F-scale.

**Results:** Participants achieved a mean F-scale score of 3.4. Only seven per cent showed neutral or positive attitudes towards obesity ( $\leq 2.5$ ). Less fat phobia was associated with beliefs that obesity was not a result of the person's self-control ( $p = 0.0001$ ) and had better attitudes towards obese people ( $p = 0.0001$ ). Men had higher risk of fat phobia ( $OR = 1.5$ ).

**Conclusions:** High prevalence of phobias and negative attitudes towards obesity was observed. Men had higher stigma.

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Key words: *Obesity. Stigmatization. Attitudes. Phobia. Medical students. Psychology students.*

### CREENCIAS, ACTITUDES Y FOBIAS HACIA LA OBESIDAD ENTRE ESTUDIANTES MEXICANOS DE LAS CARRERAS DE MEDICINA Y PSICOLOGÍA

#### Resumen

**Introducción:** Se ha observado una alta frecuencia de estigmatización entre el personal de salud hacia las personas con obesidad.

**Objetivo:** Evaluar las creencias, actitudes y fobias que los estudiantes de medicina y psicología tienen hacia las personas con obesidad.

**Métodos:** Se realizó un estudio transversal en 528 estudiantes de las carreras de psicología y medicina de la Universidad Autónoma de Baja California. Se evaluó el peso, la estatura y la circunferencia de cintura. Las creencias sobre obesidad fueron valoradas con la escala BAOP, las actitudes hacia las personas con obesidad mediante la escala ATOP, y la fobia hacia la obesidad con la escala F.

**Resultados:** Los participantes obtuvieron una calificación media de la escala F de 3,4. Solamente siete por ciento presentaron una actitud neutral o positiva ( $\leq 2,5$ ). Se observó una asociación entre menos fobia con el hecho de considerar que la obesidad no es el resultado absoluto del auto control de las personas ( $p = 0,0001$ ) y también con una mejor actitud hacia las personas con obesidad ( $p = 0,0001$ ). Los hombres presentaron más fobia hacia la obesidad que las mujeres ( $OR = 1,5$ ).

**Conclusiones:** Se observó una alta prevalencia de fobia y actitudes negativas hacia las personas con obesidad. Los hombres presentaron mayor grado de estigmatización.

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Palabras clave: *Obesidad. Estigmatización actitudes. Fobia. Estudiantes de medicina. Estudiantes de psicología.*

### Introduction

Obesity (O) is a global public health problem and is especially severe in Mexico.<sup>1-4</sup> The O is also related to

psychological and psychiatric disorders such as low self-esteem, depression, anxiety, bipolar disorder and panic attacks.<sup>5-8</sup> Several studies have investigated prejudice, negative attitude, phobia, stigma and discrimination that exist towards people with O among professionals and students in the area of health<sup>9-13</sup>, schoolchildren<sup>14-16</sup>, and teachers and parents<sup>17</sup>.

Studies have shown that most of the participants believe O is caused by lack of exercise or excessive food intake<sup>11,18,19</sup>. Discrimination has also been documented due to body weight in various life areas such as education, employment, health care and interpersonal rela-

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tionships<sup>20,21</sup>. These negative attitudes increase the likelihood that people with O adopt or maintain poor eating habits and a reduction of physical activity<sup>22</sup>.

The purpose of this study is to evaluate the beliefs, attitudes and phobias that medical and psychology students from a Mexican city bordering USA have towards people with obesity.

## Methodology

**Design and study sample.** A cross-sectional study was conducted with 528 students from the first and last year of the School of Medical and Psychology at the Autonomous University of Baja California (UABC).

### *Ethical considerations*

The project was approved by the Ethics Committee of the Medical and Psychology School from UABC. All participants signed an informed consent.

### *Recruitment and training*

Three students were trained to take anthropometric measurements and apply the questionnaires.

## Data collection

### *Anthropometry*

A portable scale (Tanita model Corp, Tokyo, Japan, adjusted to 0.1 kg with a precision of 100 g, and a range of 0.1-130 kg), a stadiometer (Model 214 Road Rod, Seca Corp, Hanover, MD, USA) and a flexible measuring tape (Seca brand with a range of 0-200 cm) were used to determine weight, height and waist circumference (WC) respectively. The measurements and the application of the questionnaires were conducted during the school year from August to December 2013 in the classrooms. WC values were compared to WHO criteria<sup>24</sup> where the waist  $\geq 94$  cm in men is considered abdominal obesity (AO) and  $\geq 80$  cm in women. The body mass index (BMI) was calculated using the formula  $BMI = \text{weight in kg}/\text{height in meters}^2$ . BMI values were compared to WHO criteria<sup>23</sup>. Underweight, BMI  $< 18.5$  kg/m<sup>2</sup>; normal weight, BMI 18.5-24.99 kg/m<sup>2</sup>; overweight, BMI 25-29.99 kg/m<sup>2</sup>; class I obesity, BMI 30-34.99 kg/m<sup>2</sup>; class II obesity, BMI 35-39.99 kg/m<sup>2</sup> and class III obesity BMI  $\geq 40$  kg/m<sup>2</sup>.

### *Standardization of measurements*

Three evaluators were trained for assessing inter and intra-individual variation for weight, height and WC.

Results were considered homogeneous when the measurements were higher than 0.90.

## Questionnaires

Participants were invited to complete the BAOP (Beliefs About Obese People) scale<sup>24</sup>, the ATOP (Attitudes Toward Obese People) scale<sup>24</sup> and the F-scale (Fat Phobia Scale)<sup>25</sup>. The BAOP scale was used to evaluate explicit beliefs regarding O and contains eight items that are scored on a six-point scale (-3 = I strongly disagree, +3 = I strongly agree). Responses were scored according to the instructions reported by Allison<sup>24</sup>. A score ranging from 0 to 48 was obtained. Higher scores indicate a stronger belief that O is not under an obese person's self-control. Explicit attitudes toward O were evaluated through the ATOP scale, which contains 20 items rated on a six-point scale (-3 = I strongly disagree to +3 = I strongly agree). Responses were also scored according to the instructions reported by Allison<sup>24</sup>. A score ranging from 0 to 120 was obtained. Higher scores indicate stronger positive attitudes towards people with O. The F-scale was used to evaluate fat phobic attitudes, and contains 14 items that are used to describe people with O. Participants indicated on a scale of 1 to 5, which one was the best adjective that described their beliefs about people with O. Responses were scored according to instructions published by Bacon et al.<sup>25</sup> which provides a possible score from 1 to 5. Higher scores indicate greater phobias. Based on the design of the scale, a score of 2.5 would indicate a neutral attitude, a score less than 2.5 would indicate a positive attitude and a score greater than 2.5 would indicate a negative attitude. The participants were also asked how much contact they had with obese people at school or in their personal life, and they were given four options: 1 = much contact, 2 = some contact, 3 = hardly any contact and 4 = no contact (question adapted from Kerby, 2008)<sup>26</sup>.

### *Data collection procedure*

Recruitment of participants and data collection was performed during the 2013-2014 school year. Before taking the anthropometric measures and applying the questionnaires, the purpose of the study was explained to the students being careful not to prejudice the results.

## Statistical analysis

Data capture was carried out by two members of the research group. All data were analyzed using SPSS version 22. Variables were examined for normality, means, standard deviations, frequencies and quartiles of parametric and nonparametric variables were calcu-

lated. Spearman's correlation was used to assess the association between scales. Logistic regression was performed to see the probabilities of having a higher score on the scales with the variables sex and contact with people with O. The level was set at < 0.05.

### Reproducibility and reliability

The BAOP scale showed a Spearman's of 0.63-0.91 and a Cronbach's alpha reliability of 0.70. The ATOP scale produced a Spearman's of 0.67-0.98 and a Cronbach's alpha reliability of 0.84. The F-scale produced a Spearman's of 0.75-0.97 and a Cronbach's alpha reliability of 0.85.

### Participants

All the students from first and final year enrolled in the School of Psychology and Medical were selected. Three hundred and two psychology students and 315 medical students were enrolled. Two hundred and fifty (83%) medical students and 278 (88%) psychology students for a total of 528, agreed to participate (56.3% were women). The participants' average age in years was  $20.7 \pm 3.0$ .

According to WHO classification criteria<sup>23</sup>, 7% were underweight, 53% had normal weight, 25% had OW, 16% had O and 34% of the participants had AO. Forty eight percent of women in psychology had AO and 39% of female medical students; 27% of male psychology students had AO and 17% of male medical students. On average the WC was higher in female psychology students (+3 cm) compared to women in medical school ( $p = 0.038$ ). No significant differences in age, BMI, OW and O among medical and psychology students were observed.

### Results

Psychology students achieved a mean (SD) BAOP score of 18.6 (5.7) and medical students 16.6 (5.5); a mean (SD) ATOP score of 75.6 (14.4) and 69.6 (17.3) in psychology and medical students respectively, and a mean (SD) F-scale score of 3.25 (0.5) in psychology and 3.5 (0.5) in medical students. Higher F-scale scores were observed in older medical students ( $p = 0.0001$ ).

The BAOP and the ATOP scales were correlated ( $Rho = 0.3$ ,  $p = 0.0001$ ), and also a negative correlation between the BAOP and the F-scale ( $Rho = -0.34$ ,  $p = 0.0001$ ) was observed. No significant correlations were found with age, BMI or WC.

The ATOP scale with the F-Scale had a negative correlation of  $-0.49$  ( $p = 0.0001$ ). Students who had more contact with persons having excess fat, were more likely to have a better attitude ( $OR = 2.8$ , 95% CI 1.26, 6.11,  $p = 0.012$ ) towards people with obesity.

The F-scale, had a negative correlation ( $Rho = -0.10$ ,  $p = 0.021$ ) with BMI. Men were more likely to have fat phobias ( $OR = 1.5$ , 95% CI, 1.04, 2.08,  $P = 0.029$ ).

Spearman's correlations of the BAOP, the ATOP and the F-scale with other variables among psychology and medical students are presented in table I.

Men in medical school were more likely to have fat phobias ( $OR = 3.0$ , 95% CI, 1.76, 5.24,  $P = 0.0001$ ) than those in psychology school, and women in medical school were 2.7 more likely to have fat phobias ( $OR = 2.7$ , 95% CI, 1.70-4.40,  $P = 0.0001$ ) than those in psychology.

Participants of both schools achieved a mean (SD) F-scale score of 3.4 (0.53), which represented an average level of fat phobia, 12 (2.3%) students showed a high level ( $\geq 4.4$  points) of fat phobia<sup>26</sup>. Only 36 (6.8%) students demonstrated positive or neutral attitudes towards people with O, score  $\leq 2.5$ . The distribution of students with negative attitudes towards people with excess fat is presented in table II.

The 5 most frequently mentioned adjectives by psychology and medical students about people with obesity were; likes food, overeats, slow, poor self-control and inactive. The less reported adjectives were; having no endurance, weak, self-indulgent, lazy and unattractive.

### Discussion

The results of this study indicate that students from the psychology and medical school at the Mexico-US border have little knowledge about the causes of O, have negative attitudes towards people with O and a high level of fat phobias. Psychology students achieved a mean BAOP score of 18.6 and medical ones of 16.6. These are consistent with those reported in medical students (16.5 and 17.5) in New Jersey and North Caroli-

**Table I**  
Spearman's correlations of BAOP, ATOP and F-scale with other variables

Variables	Psychology	Medical
BAOP	rs (p)	rs (p)
ATOP	0.34 (0.0001)	0.25 (0.0001)
F-scale	-0.30 (0.0001)	-0.31 (0.0001)
Age	0.10 (0.126)	-0.19 (0.001)
WC	-0.06 (0.326)	-0.08 (0.191)
BMI	-0.04 (0.571)	-0.11 (0.073)
ATOP		
F-scale	-0.43 (0.0001)	-0.50 (0.0001)
Age	0.12 (0.060)	-0.16 (0.006)
WC	-0.06 (0.370)	0.11 (0.076)
BMI	0.00 (0.944)	0.08 (0.205)
F-scale		
AGE	0.03 (0.617)	0.14 (0.018)
WC	-0.01 (0.840)	-0.15 (0.015)
BMI	-0.03 (0.700)	-0.17 (0.006)

WC: Waist circumference. BMI: Body Mass Index.

**Table II**  
Students who agreed with negative adjectives is the F-scale

Adjectives	Psychology N = 250		Adjectives	Medical N = 278	
	N	%		N	%
Likes food	198	(79.2)	Likes food	232	(83.5)
Overeats	163	(65.2)	Overeats	216	(77.7)
Slow	143	(57.2)	Inactive	187	(67.3)
Poor self-control	113	(45.2)	Slow	183	(65.8)
Inactive	107	(42.8)	Shapeless	167	(60.1)
Insecure	107	(42.8)	Low self-esteem	158	(56.8)
Shapeless	103	(41.2)	Insecure	157	(56.5)
Low self-esteem	100	(40.0)	No will power	156	(56.1)
No will power	91	(36.4)	Poor self-control	147	(52.9)
Lazy	74	(29.6)	Unattractive	134	(48.2)
Unattractive	72	(28.8)	Lazy	115	(41.4)
Self-indulgent	58	(23.2)	Weak	77	(27.7)
Weak	41	(16.4)	Self-indulgent	72	(25.9)
Having no endurance	27	(10.8)	Having no endurance	30	(10.8)

na<sup>27,28</sup> and higher than those reported among trainee dietitians, doctors and nurses (13.4) in the United Kingdom<sup>10</sup>. The mean ATOP scores are similar to those reported by medical students in New Jersey<sup>27</sup>. No differences in attitudes were observed between genders, which is consistent with those observed in Virginia<sup>29</sup>. However, in New York, the attitudes of male graduates in psychology towards people with O were more positive<sup>30</sup>. Participants who have more contact with people with excess fat showed a better attitude towards them. The level of phobias of medical students was consistent with those reported by Swift et al.<sup>10</sup> in medical students from the United Kingdom and by Wolf<sup>31</sup> in physician assistant students from New York.

Additionally, this study found that psychology students have better knowledge about the causes of O, less negative attitudes and phobias towards people with O. The positive correlation between the BAOP and the ATOP scales suggests that a better understanding of the causes of O leads to more positive attitudes towards people with OW and O. This suggests the need to increase the knowledge about the causes of the O and improve the attitudes that health professionals have towards people with OW and O.

On the BAOP scale no differences were observed in the results according to age, WC, BMI, gender or contact with persons with O. On the F-scale, men had higher phobias towards people with excess fat, which was not consistent with the study reported in students of USA medical assistants<sup>32</sup>. A lower BMI associated with greater fat phobia was observed, which was not consistent with those reported by Swift et al.<sup>10</sup> in trainees in the health field and in medical students in New Jersey<sup>27</sup>. No significant correlations were observed on the BAOP scales and on the F-scale with gender or age. These results probably mean that due to cultural reasons and lack of knowledge, men and normal weight

students have less tolerance towards people with excess fat. This also indicates the need for specific content in medical and psychology school curriculums about the multiple causes of O<sup>32</sup> and more information about the stigmatization of O and its implications<sup>9-17</sup>.

The BAOP scale was associated with the ATOP scale in psychology and medical students. The ATOP and the BAOP scales were negatively associated with the F-scale. Psychology students showed no significant correlations with age, WC and BMI. These results are consistent with those reported by Allison et al.<sup>30</sup> in undergraduate and graduate students in psychology.

On the other hand, in medical students the ATOP and the BAOP scales were negatively associated with age, and was related to their year of study. The F-scale was positively associated with age and negatively with WC and BMI. These results suggest the need to focus course content on nutrition on the multi-causality of O and the causes of stigmatization toward individuals with O in nutrition, internal medicine, surgery and endocrinology clinics for medical students.

Students of both schools achieved a mean F-scale score of 3.4, which represents an average level of fat phobias. Twelve (2.3 %) showed a high ( $\geq 4.4$  points) level of fat phobias and 36 (6.8%) students demonstrated positive or neutral attitudes towards people with O, having a score  $\leq 2.5$ . These results were lower than those reported by Bacon et al.<sup>25</sup> However, that study was conducted between 1984-1991. In 1999 a lower mean among nursing students and nurses<sup>33</sup> was also observed. Trends of stigmatization of O might have changed since the early 2000's in countries where changes in the curriculum of medical schools have been made. Nonetheless, the results of these Mexican students show less stigmatization than those observed in recent studies in students in health professional<sup>10,31,34</sup>. The five most frequently variables measured referring

to people with O by psychology and medical students were: likes food, overeats, is slow, has poor self-control and is inactive. These results are similar to those reported in a study of dietetic<sup>34</sup> and physician assistant students<sup>31</sup> in New York.

Among the limitations of this study the participants were in the first and last year of their careers, so it cannot be determined whether the change is continuous or limited to a year, because it is a cross-sectional study and the cause and effect cannot be assessed. The BAOP, the ATOP and the F-scale evaluated explicit bias towards O. However it has been suggested that assessments of implicit or indirect attitude are better indicators because some people are hesitant to respond honestly<sup>35</sup>.

Among the strengths of the study it might be mentioned that this is the first study in Latin America that assesses these attitudes of medical and psychology students using validated scales, such as the BAOP, ATOP and the F-scale. The reproducibility and internal consistency of the three questionnaires in the study population were adequate and the participation of the students was higher than 80%.

In conclusion a high frequency of fat phobias and negative attitudes towards O was found. Men and those having little or no contact with people with O demonstrated a higher stigma towards the obese. It is recommended that in pediatrics, nutrition, internal medicine and endocrinology courses in psychology and medical schools, should include content on the causality of O and the effects of stigmatization towards O.

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