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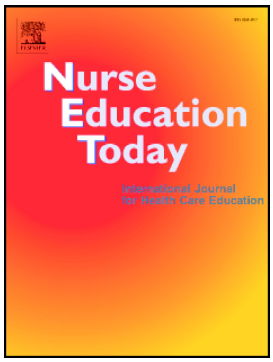


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# CHANGES IN ANTI-FAT ATTITUDES AMONG UNDERGRADUATE NURSING STUDENTS

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**Blinding codes in the manuscript:** XXX1: Faculty of Nursing, Physiotherapy and Podiatry at Universidad de Sevilla (Spain).



## ABSTRACT

Background: The number of people with obesity has been increasing significantly in recent decades. Nursing students play a role in the care of obese patients, but the presence of a

stigma regarding this patient group reduces the quality of care due to a climate of mistrust and lack of expectations.

Objectives: To analyse if the anti-fat attitudes of nursing students at the XXX1 change during their degree training.

Design: A cross-sectional study was carried out.

Settings: XXX1 undergraduate nursing institution in Spain.

Participants: 578 nursing students enrolled at the XXX1 in all academic years, from the first through the fourth.

Methods: Following ethical approval, each participant took part in an individual self-report via the Anti-Fat Attitudes (AFA) Questionnaire, in its validated Spanish version.

Results: The mean standardised AFA total was 2.29. by domains: 1.29 in *Dislike*, 2.87 in *Fear of fat*, and 3.73 in *Willpower*. Analysis of variance tests showed significant differences in the AFA total score and domains by sex and academic year. Multiple linear regression analysis demonstrated that the highest prejudices were shown by enrolled participants in their first year, particularly when the AFA total score was considered.

Conclusions: Nursing students at the XXX1 do not have many prejudices towards obese people. Anti-obesity attitudes among nursing students decrease as the students progress in their degree, implying that the specific training received (degree curriculum) also enables students to develop their non-technical skills.

Keywords (Medical Subject Headings): Attitudes; Education; Graduate; Nursing Students; Obesity; Prejudice.

## INTRODUCTION/BACKGROUND

The World Health Organisation defines obesity as an excessive or abnormal accumulation of fat that can be harmful to health, with a body mass index greater than 30 kg/m$^2$ (World

Health Organisation, 2013). An increased intake of food rich in calories and decrease in physical activity continue to be highlighted as the main causes of this condition, although evidence suggests that it is the result of a combination of biological and environmental factors (Daníelsdóttir et al., 2010). Obesity has consequences for health, including cardiovascular diseases, locomotive system disorders, and certain cancers, such as colon and breast cancer (World Health Organisation, 2013).

At a global level, this is a public health problem, as the number of people affected has increased significantly in the last three decades, strongly impacting obesity-related morbidity and mortality (Swinburn et al., 2011). In 2016, 39% of the world's adult population was overweight and 13% was obese, representing a total of 1,900 million people. Furthermore, among children and adolescents the prevalence of overweight and obesity has increased considerably, from 4% in 1975 to more than 13% in 2013 (World Health Organisation, 2013).

In Spain, based on data collected by the National Statistics Institute (2016), 52.6% of the population 18 years old or more had exceeded a normal weight; of these, 16.9% were obese and 35.7% were overweight. This increase in the number of people with obesity and overweight, along with the multiple associated pathologies that this presents, requires the health system's continuous attention and involvement (Phelan et al., 2015; Saxena and Kumar, 2017).

However, there exists a negative perception and attitude towards obese people on the part of health professionals, not for who the patients are, but for their weight (Keyworth et al., 2013). The origin of this attitude could be related to the frustration that medical personnel feel when carrying out the complex care of these people (Darling and Atav, 2019; Phelan et al., 2015). The presence of a stigma towards obese people at the heart of the health system reduces the quality of care provided to them as it generates a climate of mistrust and lack of expectations

among professionals regarding the treatments and interventions established for the care of these people and the patients' failure to bond with them (Dietz et al., 2015; Hall and Kahan, 2018). This situation of discrimination is compounded by the fact that the health infrastructure and equipment are not adapted to these people (Tanneberger and Ciupitu-Plath, 2017). This is why, in some cases, such patients do not benefit from additional medical tests or particular treatments, causing them embarrassment and shame (Saxena and Kumar, 2017). Nurses and future nursing professionals in particular play a very important role in the care of obese patients (Pervez and Ramonaledi, 2017) as they are the ones in most direct contact with them, mainly in primary care consultations, and are in charge of developing interventions as well as strategies that foster changes in behaviours harmful for health (Phelan et al., 2015; Williams-Hailey, 2015).

However, most previous research reports that nursing students also harbour prejudices against obesity (Nicholls et al., 2016; Snethen et al., 2014) since they have trouble and lack training in dealing with people who are obese (Dunagan et al., 2016) and also witness negative attitudes among qualified nurses (Keyworth et al., 2013).

In addition, the key role that training plays in reducing this kind of prejudice among health students has been pointed out (Brown and Flint, 2013; O'Brien et al., 2010), but no scholars have analysed in depth whether this anti-fat attitude changes during training at university. Specifically, Pervez and Ramonaledi (2017) and Tsai et al. (2017) argued that nursing schools should enhance training regarding knowledge, skills, and appropriate attitudes during degree-seeking to enable students to provide quality healthcare for obese people. In light of these points, the present study will analyse how nursing students' prejudices against obesity evolve during their degree training at university.

## METHODS

### Sample

A cross-sectional study was carried out. Students from the first to the fourth academic years who enrolled in 2018 in the nursing programme at the XXX1 were included. A total population study was proposed since it is well defined, accessible, and not too large for data collection. However, not all the students were approached since they did not attend lessons on the collection day.

Instrument

The study used an appropriate validated scale in Spanish (Magallares and Morales, 2014) called the Anti-fat Attitudes Questionnaire (AFA) (Crandall, 1994). The AFA is a scale that indicates explicit prejudices against obesity and is made up of 13 items divided into three domains (*Dislike*—items 1 to 7, *Fear about fat*—items 8 to 10, and *Willpower*—items 11 to 13), with Likert-type answer options from 1 (completely disagree) to 7 (completely agree). The AFA total score is the sum of the values of the scale's items. For the AFA and each domain, the scores and their standardised values (dividing the score by the number of items) are presented since they enable a comparison among the values and with previous results. In both cases, the higher the score, the stronger the anti-obesity attitude. The Spanish version of this scale had an internal consistency of 0.85 measured by Cronbach's alpha (Magallares and Morales, 2014).

The Cronbach's alpha coefficient for the AFA total score was 0.73. By domains, the domain *Fear of fat* had the highest reliability (0.82), followed by *Willpower* (0.75) and *Dislike* (0.58). Considering that the internal reliability of the *Dislike* domain was low, some extra tests were carried out to determine whether the reliability of this domain would increase if an/some item/s was/were deleted (Field, 2013; Mansour, 2015). It was detected that if item 2—'I don't have many friends that are fat'—was eliminated, the internal consistency of the *Dislike* domain would change from 0.58 to 0.68, and consequently the Cronbach´s alpha coefficient for AFA total score was 0.74. According to Hu and Bentler (1999), confirmatory factorial

analysis demonstrated a good model fit without this item ($\chi^2$=157.790, df=66, p=0.000; CFI = 0.942; RMSEA= 0.060; NFI=0.918). Standardised estimates parameters and latent factor correlations are presented in supplementary data. Therefore, the *Dislike* domain ultimately considered only six items and the AFA total score 12 items.

Techniques and procedures

Ethical and administrative approval for the study were obtained from the XXX1 prior to contacting potential participants in January 2018. As the objective of this research is to maximise the response rate, for each class group the questionnaires were collected in person instead of online. The collection was made in the courses given at the Faculty with the highest attendance rate for each academic year (all students from the same academic year have to be enrolled in the same courses, but the real attendance rate varies). Only students available in class on the day of data collection and consented were eligible and issued the de-identified self-report AFA questionnaire with additional demographic variables to complete. This was collected immediately from each student after completion. Due to the fact that the researchers did not know the number of attendees and who they were, there is not a selection bias.

Statistical analysis

The information collected was analysed with IBM SPSS version 23 programme (IBM, Armonk, NY, USA). The statistical analysis used the following: a) descriptive statistics of independent variables (age group, sex, and academic year); b) descriptive statistics, an internal consistency check through the Cronbach alpha statistic, and a pairwise correlation analysis of the AFA total score and domains; c) one-way ANOVA of the AFA total score and domains considering the age group, sex, and academic year variables; and d) multiple linear regression models estimated for each dependent variable (the AFA total score and scores of

each AFA domain). The global *F* test was examined to determine whether the models were significant.

## RESULTS

In this study, the sample consisted of 578 nursing students at the XXX1, representing 64.9% participation of the total population. The representation of students in their first academic year was greater since their attendance at subjects was mandatory (Table 1).

Table 1 also shows the predominance of women aged 25 years old or less among the respondents. Table 2 presents the mean scores and standardised values for the AFA total and each AFA domain. When the domains were compared, the *Willpower* domain showed the highest standardised value, followed by *Fear of Fat*. Three AFA domains had positive and significant correlations between each other: *Dislike* with *Fear of fat* (r = 0.22) and with *Willpower* (r = 0.22); and *Fear of fat* with *Willpower* (r = 0.24).

Table 3 presents the results of the mean differences between the respondents' demographic variables and their AFA scores. Nursing students from the first year were those who show the highest value for the AFA total score ($F$=5.212, $p < 0.001$), *Fear of fat* ($F$=5.490, $p < 0.001$) and *Willpower* ($F$=3.891, $p < 0.009$). Sex was an independent variable that showed a statistically significant difference for the *Dislike* ($F$=8.297, $p < 0.004$) and *Willpower* ($F$=5.272, $p < 0.022$) domains. In both cases, females are those who present the lowest values. In addition, younger students are those who got the highest score for the *Fear of fat* domain ($F$=3.138, $p < 0.044$).

Before performing the regression analysis, a correlation test was carried out among the independent variables. This revealed a significant strong positive correlation between age group and academic year ($r = 0.456$, $p < 0.001$). Because the total AFA was found to be statistically different for each academic year (Table 3, $p<0.001$), but not between age groups, the latter independent variable was excluded from the regression model to avoid collinearity.

Multiple linear regression models (Table 4) showed a negative statistically significant relationship of sex with *Dislike* and *Willpower*. This meant that women had fewer prejudices towards obesity than men in terms of *Dislike* and *Willpower*. When their academic year was considered, this was shown to have a statistically significant influence on anti-obesity attitudes. As was reported in Table 3, specifically, these attitudes decreased as students progressed in their degree, with the highest scores reported in the first year and the lowest scores in the last year. However, from the second to third year, it appeared that nursing students' anti-obesity attitudes increased slightly. While the academic year did not show any effect on the *Dislike* domain, it had a statistically significant relationship with the *Fear of fat* and *Willpower* domains (Table 4). Regarding the *Fear of fat* domain, the results from Table 3 showed that second-year students had the least prejudices against obesity, followed by fourth-year students. In contrast, when the *Willpower* domain was considered, students in the last half of their degree (third and fourth year) had lower prejudices.

## DISCUSSION

In this study of 578 nursing students at the XXX1, the questionnaire return was 65%, which is considered high (Gillis and Jackson, 2002).

The reliability of the AFA total score was slightly lower than that reported in a sample of university students in Spain (Magallares and Morales, 2014), but it is considered acceptable (Tavakol and Dennick, 2011). The Cronbach's alpha coefficients of *Fear of fat* and *Willpower* were very close to those reported by Phelan et al. (2014) and Robinson et al. (2014). Although the *Dislike* domain had a lower internal reliability than in previous research (Magallares and Morales, 2014; Phelan et al., 2014; Robinson et al., 2014), it is very close to 0.7. Thus, the result on AFA internal consistency check, adjustment in Dislike domain and pair-wise correlation tests specifically strengthens the psychometric properties of AFA self-report instrument and supports its use as appropriate for data collection in this study.

Nursing students at the XXX1 showed a lower level of prejudices against obesity than those reported by Nicholls et al. (2016) and Darling and Atav (2019) in nursing students from the United Kingdom and United States, by Puhl et al. (2014) in health post-graduate students in USA. The margin of difference in the standardised values ranged between 0.5 and 0.7. The reported differences between countries could be due to the different rate of obese people. Based on the OECD (2017), this percentage is much higher in Anglo-Saxon countries than in Spain. Based on Social Identity Theory, the results should be lower than in Spain but there is also evidence to the contrary (Latner et al., 2005) that supports our findings. Notwithstanding, the level was similar to that of medical students from Germany (Herrmann-Werner et al., 2019). Furthermore, the anti-fat attitudes showed by this sample of nursing students were also lower than those reported by professional nurses (Brown and Thompson, 2007; Mercer and Tessier, 2001; Pervez and Ramonaledi, 2017). This finding is similar to that reported by Yılmaz and Yabancı Ayhan (2019), who demonstrated that qualified nurses have higher prejudices towards obese people than students. The reason behind this behaviour is not exactly known, but it could be linked with stress due to their high work level.

By domains, that of *Willpower* had the highest standardised values and that of *Dislike* the lowest, which matches the study of Crandall et al. (2001). Focusing on the *Willpower* domain, it was found that there are more negative perceptions towards people with obesity, in line with previous studies (O'Brien et al., 2010; Robinson et al., 2014; Snethen et al., 2014), which argued that nursing students perceive obese people as lazy and lacking in self-control. However, Yılmaz and Yabancı Ayhan (2019) reported that most nursing students agree with the fact that '*Obesity is rarely caused by a lack of willpower*.' Regarding the *Dislike* domain, the standardised value was lower than that reported by Robinson et al. (2014) in nursing students from Australia. Notwithstanding, the evidence is not homogeneous when it is compared with the standardised value from students of other health degrees. While the

standardised value obtained in this study was very similar to that obtained by O'Brien et al. (2010) from university students enrolled in a health promotion/public health degree, Phelan et al. ( 2014) and Robinson et al. (2014) found that most health science students (excluding nursing) have more explicit antipathy towards fat people, except in the case of those who study dietetics. A bias towards disagreement was found for the domain *Fear of fat*. This result contrasts with the evidence found by Robinson et al. (2014) among health science students, including nursing students, who reported a higher level of personal concern about becoming fat. In the same line, the results supported the finding that nursing students from Spanish universities had a lower *Fear of fat* than medical students in the United States (Phelan et al., 2014).

Our research, which focused on nursing students from Spain, reported positive correlations between the three AFA domains in the same line as the study of Magallares and Morales (2014), which was based on a sample of Spanish university students. These coefficients were also similar to those obtained by Phelan et al. (2014) among students of medical science except in the case of the relationship between *Dislike* and *Willpower* (the coefficient was higher in this case). However, Crandall (1994) only showed a correlation between the *Dislike* and *Willpower* domains among American undergraduates.

The lack of agreement with these latest results is due to the difference in the standardised value of *Fear of fat* domain, as it was much higher among the American students in Crandall's (1994) study population. To understand these differences, it is necessary to consider the role of the body mass index (BMI) in the AFA (Zhu et al., 2011). Comparing BMIs from Spain and the United States reveals that the percentage of the American adult population with obesity is considerably higher than the corresponding percentage of the Spanish population—22.9 versus 35.7 (European Association for the Study of Obesity, 2014).

With regard to sex, it is only noted that men scored higher than women in the regression models of *Dislike* and of *Willpower,* which agrees with the findings of other studies of university students (Crandall, 1994; Magallares and Morales, 2013; O'Brien et al., 2012). In the same line, Phelan et al. (2014) found that medical students behave in the same way, although they showed that women reported a higher level of personal concern about becoming fat (*Fear of fat* domain) than men. According to our results, women also had a higher score in the *Fear of fat* domain than men although the difference was not statistically significant. This is consistent with expectations since women more often assume the social norm of slimness (Magallares and Morales, 2013). This difference by sex has been explained by a weight bias through the theory of attribution, according to which people with overweight or obesity would be responsible for their appearance (Poon and Tarrant, 2009; Puhl et al., 2015; Tanneberger and Ciupitu-Plath, 2017). However, there is scarcity of previous evidence about it in nursing students since articles do not usually report it. As was argued by Dunagan et al. (2016); Nicholls et al. (2016); Poon and Tarrant (2009); Yılmaz and Yabancı Ayhan (2019), this is due to the fact that usually samples mainly consist of women (more than 85%). By academic year, it was noted that prejudices against obesity decreased as nursing students progressed in their degree programme. The changes observed in anti-fat attitudes support previous evidence that nursing attitudes are largely influenced at the undergraduate level (Nicholls et al., 2016), which is consistent with Transformative Learning Theory arguments (Kear, 2013; Morris and Faulk, 2012). This approach is a cognitive adult learning theory, mainly based on higher education, which postulates that young adults build their attitudes based on prior learning or life experiences (Mezirow, 2000), which can be changed if unexpected events occur followed by a critical reflection.

Most previous research has focused on the impact of teaching interventions, such as an unexpected event, on students' prejudices towards obese people (Daníelsdóttir et al., 2010),

but the results are heterogeneous. This could be explained by the Transformative Learning Theory since this teaching intervention may be a transformative experience for nursing students, but they could have difficulties in processing the learning from the experience and/or the fact that some students need more time to completely change their attitudes (Kear, 2013). In this sense, nursing educators should guide and accompany their students in this process.

For this reason, there is a call for health sciences schools to address this problem in a holistic way, as opposed to focusing on isolated interventions, by considering modifications to their curricula to decrease students' anti-obesity attitudes (Poon and Tarrant, 2009; Robinson et al., 2014). One of the main recommended changes to nursing curricula is to emphasise the uncontrollable causes of obesity (Darling and Atav, 2015; Puhl et al., 2014), so that obesity will not be perceived only as a lack of willpower. In addition, training should also encourage the development of non-technical skills such as empathy, human dignity and respect (American Nurses' Association, 2015; Dunagan et al., 2016), which could be better learned through transformative experiences.

However, previous research reveals that nursing students may be negatively influenced by the anti-obesity prejudices of professional nurses who are their trainers (Keyworth et al., 2013; Puhl et al., 2014). Although the scientific literature in this field does not make any suggestion in this regard, nursing schools should carry out interventions to control it.

Finally, since nurses are in a key position to facilitate change in obese people (Keyworth et al., 2013), the development of communicative skills is also recommended at the undergraduate level.

Strengths and limitations

To our knowledge, this study is the first to examine the changes in anti-fat attitudes among undergraduate nursing students. The main strengths of this study were the high response rate,

and the fact that internal consistency was improved through the deletion of one item, its validity being checked through a confirmatory factorial analysis. One of the limitations of this study is that the questionnaires were self-reported and not verified by other means, although they were answered anonymously. Respondents may answer the questionnaire in a socially desirable manner, so that the real anti-fat attitude of nursing students analysed would be higher than that reported. As a consequence of the collection method chosen, some students were not approached due to their being absent during the lesson, and it was not possible to reach them another day or by another method due to the anonymity. Another limitation is that the study design was cross-sectional, and the associations observed do not necessarily establish a cause–effect relationship. Future research could go deeper into the changes observed in the anti-obesity attitudes of nursing students, by considering more characteristics of the participants such as BMI or ethnicity and/or their practical experience. With a view to improving knowledge about the importance of this topic for students, it also suggested that meta-analysis studies be conducted with data obtained from research carried out in other countries that have used the AFA.

## CONCLUSIONS

Our research found that nursing students at the XXX1, especially women, do not have many prejudices towards obese people, and that these decrease as the students progress in their degree. This has implications for teaching and care practice. If nursing students have lower prejudices towards obese people, they will be able to provide patients with non-biased care. Although teaching has improved the attitude of future nurses, a set of suggestions to enhance nursing students' attitudes has been provided based on the literature. Our results support the notion that the nursing curriculum at the XXX1 helps to decrease anti-fat attitudes and foster tolerance towards obese people in future professional nurses, an endeavour that must continue to be strengthened, especially in the first academic years, as it is indispensable for

the practice of care, the building of the identity of nursing, and professional advancement toward excellence.

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CONFLICT OF INTEREST

None declared.

ETHICAL APPROVAL

Ethical approval for the study was obtained from the Faculty of Nursing, Physiotherapy and Podiatry of the University of Seville.

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**Table 1. Descriptive statistics of respondents' independent variables**

| **Variables** | **Frequency (%)** | **Frequency by sex (%)** | |
|---|---|---|---|
| Age group | | Women | Men |
| ≤ 20 years old | 307 (53.11) | 250 (81.40) | 57 (18.60) |
| 21–25 years old | 234 (40.48) | 195 (83.30) | 39 (16.70) |
| ≥ 26 years old | 37 (6.41) | 22 (59.50) | 15 (40.50) |
| Academic year | | | |
| 1st | 175 (30.28) | 137 (78.30) | 38 (21.70) |
| 2nd | 186 (32.18) | 148 (79.60) | 38 (20.40) |
| 3rd | 123 (21.28) | 109 (88.60) | 14 (11.40) |
| 4th | 94 (16.26) | 73 (77.70) | 21 (22.30) |
| Sex | | | |
| Women | 467 (80.79) | | |
| Men | 111 (19.21) | | |

**Table 2. Respondents' mean scores and standardised values on the AFA total and domain sub-scales**

| **Domains** | **Mean score (SD)** | **Standardised score** |
|---|---|---|
| Dislike | 7.78 (3.06) | 1.29 (0.51) |

| | | |
|---|---|---|
| Fear of fat | 8.60 (4.62) | 2.87 (1.54) |
| Willpower | 11.20 (4.17) | 3.73 (1.39) |
| AFA Total | 27.58 (8.34) | 2.29 (0.69) |

SD = standard deviation.

**Table 3. Differences between Respondents sex, academic year, age group and AFA total and Domain mean scores (n=578)**

| | AFA total score | Dislike | Fear of fat | Willpower |
|---|---|---|---|---|
| **Sex** | | | | |
| Male | 28.505 | **8.532** | 7.95 | **12.02** |
| Female | 27.364 | **7.606** | 8.75 | **11.01** |
| **Academic year** | | | | |
| 1st | **29.617** | 8.091 | **9.65** | **11.87** |
| 2nd | **26.672** | 7.468 | **7.83** | **11.38** |
| 3rd | **27.016** | 7.984 | **8.73** | **10.30** |
| 4th | **26.340** | 7.575 | **7.97** | **10.80** |
| **Age group** | | | | |
| ≤ 20 years old | 28.245 | 7.863 | **9.01** | 11.35 |
| 21–25 years old | 26.829 | 7.598 | **8.23** | 11.00 |
| ≥ 26 years old | 27.027 | 8.297 | **7.46** | 11.27 |

Statistically significant mean differences tests are reported in bold (p<0.05).

**Table 4. Multiple linear regression analysis for Anti-Fat Attitudes (AFA total and Domains) of nursing students (N=578)**

| | Variables | B | SE | t | P |
|---|---|---|---|---|---|
| **Total score** | Constant | 31.499 | 1.680 | 18.75 | 0.000 |

| | | | | | |
|---|---|---|---|---|---|
| | Sex | -1.056 | 0.875 | -1.21 | 0.228 |
| | Academic year | | | | |
| | 2nd | -2.932 | 0.868 | -3.38 | 0.001 |
| | 3rd | -2.492 | 0.974 | -2.56 | 0.011 |
| | 4th | -3.283 | 1.054 | -3.12 | 0.002 |
| **Dislike** | Constant | 9.798 | 0.619 | 15.83 | 0.000 |
| | Sex | -0.957 | 0.322 | -2.97 | 0.003 |
| | Academic year | | | | |
| | 2nd | -0.611 | 0.319 | -1.91 | 0.056 |
| | 3rd | -0.009 | 0.358 | -0.02 | 0.980 |
| | 4th | -0.523 | 0.388 | -1.35 | 0.179 |
| **Fear of fat** | Constant | 8.229 | 0.930 | 8.85 | 0.000 |
| | Sex | 0.798 | 0.486 | 1.65 | 0.100 |
| | Academic year | | | | |
| | 2nd | -1.823 | 0.481 | -3.82 | 0.000 |
| | 3rd | -1.002 | 0.539 | -1.86 | 0.064 |
| | 4th | -1.678 | 0.584 | -2.88 | 0.004 |
| **Willpower** | Constant | 13.472 | 0.841 | 16.01 | 0.000 |
| | Sex | -0.896 | 0.438 | -2.05 | 0.041 |
| | Academic year | | | | |
| | 2nd | -0.486 | 0.434 | -1.12 | 0.264 |
| | 3rd | -1.480 | 0.488 | -3.04 | 0.003 |
| | 4th | -1.082 | 0.528 | 16.01 | 0.000 |

Total score: $F=4.28$, $P < 0.001$, $\Delta R^2=0.026$, $P< 0.002$

Dislike: $F=3.40$, $P < 0.001$, $\Delta R^2=0.009$, $P< 0.154$.

Fear of fat: F=4.81, P < 0.001, $\Delta R^2$=0.028, P< 0.001.

Willpower: F=6.98, P < 0.001, $\Delta R^2$=0.018, P< 0.015.

Author statement

**María de los Ángeles Rodríguez-Gázquez:** Conceptualization, Methodology, Formal analysis, Writing - Original Draft; **Ana Ruiz-Iglesias:** Methodology, Data curation; **José Rafael González-López:** Conceptualization, Methodology, Validation, Formal analysis, Writing - Original Draft, Writing - Review & Editing.

Highlights

- Prejudices against obesity decrease as nursing students progress in their degree
- Men score higher than women in the regression models of *Dislike* and of *Willpower*
- Developing non-technical skills in nursing degree fosters tolerance to obese people