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## ORIGINAL ARTICLE

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### Obesity bias among preclinical and clinical chiropractic students and faculty at an integrative health care institution: *A cross-sectional study*

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**Objective:** The purpose of this study was to assess the prevalence of obesity bias among preclinical and clinical chiropractic students and faculty at an integrative health care academic institution.

**Methods:** This was a cross-sectional quantitative, single-method survey with group comparison using the Beliefs About Obese Persons scale (BAOP) and the Attitudes Toward Obese Persons scale. Both instruments were administered as a single 28 question survey via email to 450 students and 46 faculty members in a doctor of chiropractic (DC) program. Differences were determined by 2 tailed *t* tests.

**Results:** The response rate for faculty and students was 31% and 65%, respectively. One hundred forty-three DC students, preclinical ( $n=65$ ) and clinical ( $n=78$ ), and 30 DC faculty, preclinical ( $n=15$ ) and clinical ( $n=15$ ) completed the survey. Both students and faculty harbored antiobesity attitudes and moderate antiobesity beliefs. Students demonstrated slightly more positive attitudes toward obese persons than did preclinical faculty. Although preclinical faculty did not demonstrate more biased attitudes than did preclinical students ( $p=.057$ ), they were more biased than clinical students ( $p=.26$ ). On the BAOP, preclinical faculty scored significantly lower than both preclinical students and clinical students ( $p=.013$  and  $.017$ , respectively).

**Conclusion:** Obesity bias was common among clinical and preclinical chiropractic students and faculty at our institution. A cultural shift that reduces bias may require changes in both the curriculum and cocurriculum.

**Key Indexing Terms:** Attitude of Health Personnel; Bias; Students, Health Occupations; Obesity; Prejudice

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### INTRODUCTION

The expression of professional attitudes is integral to the delivery of effective patient care.<sup>1</sup> Demonstrating respect and empathy toward patients and preventing the emergence, or persistence, of bias is an essential quality for health care providers.<sup>2,3</sup> Yet, despite the recognition that harboring bias, stereotypes, and negative attitudes (prejudice) can be a significant barrier to effective patient-centered care, many studies have reported on the pervasiveness of these affects among health care practitioners.<sup>4–11</sup> One significant area of concern is the startling prevalence of obesity bias within the allopathic medicine health care community.<sup>12–22</sup> The present study investigated whether this same bias was also commonplace among members of the complementary and integrative medicine (CIM) community.

Obesity bias refers to negative attitude toward obese individuals. Studies have demonstrated that the presence of bias can predict and lead to prejudiced and discrimina-

tory behaviors.<sup>23–27</sup> Among health care providers, the impact of such negative attitudes toward obese patients, and the patients' corresponding behaviors, can have dire consequences.

In the past 4 decades, worldwide obesity rates have tripled in men and doubled in women. Globally, 266 million men and 375 million women were reported to be obese in 2014; 55 million adults were reported to be morbidly obese.<sup>28</sup> A 2016 study published in collaboration between the World Health Organization (WHO) and over 700 researchers worldwide predicted that by 2025, 18% of men and 21% of women worldwide will be obese.<sup>28</sup> This means that all health care providers regardless of specialty will be working with obese patients. It is therefore imperative for providers to recognize that this epidemic of obesity plaguing modern society is complex and multifactorial. It is not merely the result of the antiquated and oversimplified theory of an imbalance of *calories in versus calories out*,<sup>29–31</sup> a theory that feeds into the stigmatizing beliefs that obesity is a consequence of

inactivity, laziness, or lack of self-control. Compelling evidence demonstrates that the obesity epidemic is caused by the interplay of a variety of complex socioeconomic, cultural, environmental, genetic, and physiologic influences.<sup>30</sup> It is influenced by common food additives and processing methods,<sup>32–35</sup> select commonly prescribed pharmaceuticals<sup>36</sup> and other chemical obesogens,<sup>30</sup> imbalances in gut microbiota,<sup>37</sup> and even by failed dietary public health initiatives promoted by the health care community.<sup>38,39</sup>

With the global prevalence of obesity quickly increasing, respect for overweight and obese patients is important for effective patient care. Yet, in face-to-face interactions with obese patients, patients are still subject to stigmatizing beliefs.<sup>40,41</sup> Implicit and explicit bias toward obese patients has been reported to be highly prevalent among medical students<sup>42–45</sup> and physicians.<sup>12–15</sup> This bias is even pervasive among health care providers specializing in the treatment of obesity,<sup>17</sup> including dietitians.<sup>15,16</sup>

This affective deficit is apparent among medical students and may become worse as students' progress through their training. Even though professionalism is a key competency in most health education curricula, and respect for patients is a well-established feature of professionalism in medical education,<sup>46</sup> teaching professionalism has been recognized as a challenge in health care education.<sup>47</sup> Traditionally, teaching many of the characteristics of professionalism have been relegated to role-modeling rather than through formal instruction and assessment. While role-modeling has been identified by students as a desirable means of teaching professionalism,<sup>48</sup> studies have reported that students witness lapses in professionalism among faculty and clinical supervisors during both clinical and preclinical training<sup>49</sup>; this may leave students vulnerable to negative influence by this hidden curriculum.<sup>50–52</sup> Of further concern is that the "erosion of empathy" has been reported among third-year medical students in comparison to first-year students, suggesting that empathy in medical students declines as students progress through their training.<sup>52–54</sup> As empathy declines, so does the provider's ability to appreciate a patient's experience, to "imagine themselves in the other person's shoes" and demonstrate that understanding back to the patient.<sup>55</sup> The display of empathy has been shown to lead to improved outcomes,<sup>56</sup> whereas a lack of empathy has been correlated with increased bias among health care providers.<sup>56,57</sup>

The greatest consequence of negative attitudes and weight bias among health care providers is the highly detrimental effect it has on patient care and outcomes.<sup>58</sup> Studies have reported that weight bias in the medical environment, and in general, increases the risk of obesity, reinforces obesogenic behaviors in patients, and promotes psychological distress, depression, anxiety, and binge-eating behaviors.<sup>59–62</sup> Weight bias among providers also increases the likelihood that obese patients will forgo critical preventive screenings and medical appointments, which, coupled with the high risk of comorbidities in this patient population, can have dire consequences on patients' health and well-being.<sup>59,63,64</sup> With over 640

million people being obese worldwide and 44% of adults predicted to be obese in the United States within the next decade,<sup>28</sup> the impact of providers' attitudes can have widespread and damaging effects on public health.

There are many studies regarding the prevalence of weight bias among medical students<sup>42–45</sup> and other health professional students.<sup>16,21,65</sup> However, a literature review did not uncover any studies investigating whether this is prevalent among CIM students and faculty, particularly those studying chiropractic, the largest graduate level CIM profession in the United States.<sup>66,67</sup> The erosion of empathy observed in medical students by Hojat et al<sup>53</sup> and Newton et al<sup>52</sup> has also not been investigated in CIM students.

The purpose of this research is to assess the pervasiveness of obesity bias among preclinical and clinical chiropractic students and faculty at a CIM academic institution. Specifically, the aims of the study were to determine whether (1) chiropractic students and faculty members harbor negative attitudes toward obese patients, (2) there is a difference in attitudes between chiropractic students in their clinical vs preclinical stage of training, and (3) there is a difference in attitudes between clinical and preclinical chiropractic faculty toward obese patients.

## METHODS

### *Study Design and Study Population*

This cross-sectional study employed a quantitative, single method, survey design with a group comparison. Quantitative data were collected directly from survey respondents, using 2 self-completed, validated survey instruments: (1) The Beliefs About Obese Persons (BAOP) an 8-item, 6-choice Likert rating scale ranging from "strongly disagree" to "strongly agree,"<sup>68</sup> and (2) Attitudes Toward Obese Persons (ATOP), a 20-item 6-choice Likert rating scale ranging from "strongly disagree" to "strongly agree."<sup>69</sup> Used together, these instruments assess both beliefs/stereotypes (BAOP) and attitudes/prejudices (ATOP) as related to obesity.

The ATOP is scored from 0 to 120. Higher scores are indicative of more positive attitudes toward obese people among respondents, and low scores suggest more negative attitudes or prejudice. Internal reliability for ATOP has been demonstrated previously.<sup>70</sup> The reliability of the ATOP scale has ranged from  $\alpha = .84$  to  $\alpha = .80$ .<sup>71</sup> The BAOP is scored from 0 to 48 and assesses beliefs about causes of obesity and stereotypes.<sup>68</sup> The reliability of the BAOP is lower than the ATOP ( $\alpha = .65$ – $.82$ ).<sup>71</sup> Higher scores on the BAOP suggest beliefs that obesity is not controllable, and lower scores suggest beliefs that obesity is controllable, that obese people cause their own condition. Scores on the ATOP and BAOP have been consistently and strongly correlated<sup>68</sup> where higher BAOP scores have been associated with more positive attitudes towards obese persons. Lower BAOP scores reflects an increased likelihood of antiobesity attitudes, including harboring belief in stereotypes that, for example, obese people are lazy and lack self-control.<sup>72</sup> Mean scores on the ATOP and BAOP at 59.7 and 17.9, respectively, have been reported to demonstrate antiobesity attitudes.<sup>68</sup>

**Table 1 - Scores on the ATOP Scale**

	Preclinical Students	Clinical Students	Preclinical Faculty	Clinical Faculty
No.	65	78	15	15
Average score	57.60	59.79	49.00	52.27
Standard deviation	14.75	16.55	18.71	14.23

The ATOP and BAOP were combined into a single 28 question survey available online at [www.journalchiroed.com](http://www.journalchiroed.com) that was distributed via email using SurveyMonkey to all 450 students and 46 full-time and part-time faculty members from the doctor of chiropractic (DC) program. The sample consisted of preclinical and clinical faculty and preclinical and clinical students at an academic integrative health care institution. The size of each group was limited by the number of respondents. The survey was accessible for 2 weeks from November 2, 2016, until November 16, 2016. Following data capture, all survey records were subject to 2-tailed *t* tests assuming equal variance (Excel; Microsoft Corp., Redmond, WA).

**Ethics Statement**

Institution review board-exempt determination was received from Southern California University of Health Sciences (SCU) and University of New England (UNE). Participants were informed that they were participating in a study to “assess attitudes toward obesity.” The precise purpose of the study (determining presence of obesity bias) was not communicated to the participants to prevent the emergence of social desirability bias. This strategy is in keeping with the work on weight bias published by Swift et al<sup>16</sup> and Puhl et al.<sup>65</sup> Participants were also informed that their participation in the survey was strictly voluntary and whether they chose to participate or not had no bearing on their status at the institution or their relationships with any institutional staff, faculty, or administration. Students were informed that their participation would not have any impact on their grades. Responses to the survey were not individually identifiable and were reported in aggregate form only.

**RESULTS**

The response rate for faculty and students was 31% and 65%, respectively. One hundred forty-three DC students, preclinical (*n* = 65; 45.5%) and clinical (*n* = 78; 54.5%), and 30 DC faculty (*n* = 30), preclinical (*n* = 15; 50%) and clinical (*n* = 15; 50%), completed the survey. At 95% confidence level, the margin of error for students was 7% and for faculty was 11%. Scores for the ATOP, including sample size and standard deviations, are reflected in Table 1. Scores for the BAOP are reflected in Table 2.

**Attitudes Toward, and Beliefs About, Obesity**

Data revealed that based on the ATOP, both students and faculty harbor antiobesity attitudes, but more moderate antiobesity beliefs were revealed based on the BAOP. No statistically significant differences across

**Table 2 - Scores on the BAOP Scale**

	Preclinical Students	Clinical Students	Preclinical Faculty	Clinical Faculty
No.	65	78	15	15
Average score	31.68	31.26	27.93	30.07
Standard deviation	5.19	4.83	4.85	7.85

preclinical and clinical faculty respondents were observed on either the ATOP or the BAOP. No statistically significant differences were found across preclinical and clinical students either.

When student and faculty groups were compared, students demonstrated slightly more positive attitudes toward obese persons than did preclinical faculty on both scales. Although there were no significant differences (*t*(78) = 1.93, *p* = 0.057) between preclinical faculty (*M* = 49.0, *SD* = 18.71) and preclinical students (*M* = 57.6, *SD* = 14.75) on the ATOP, paired-samples *t* test indicated that scores were significantly lower for pre-clinical faculty than clinical students (*M* = 59.79, *SD* = 16.55), *t*(91) = 2.26, *p* = 0.026). On the BAOP, preclinical faculty (*M* = 27.93, *SD* = 4.85) scored significantly higher than did preclinical students (*M* = 31.68, *SD* = 5.19), *t*(78) = 2.55, *p* = 0.013) and clinical students (*M* = 31.26, *SD* = 4.83), *t*(91) = 2.44, *p* = .013 and .017).

**DISCUSSION**

To our knowledge, this was the first study to examine attitudes toward, and beliefs about, obesity among CIM preclinical and clinical students and faculty within a DC program at an academic integrative health care institution. This study revealed the presence of antiobesity attitudes among this study population based on the ATOP and more moderate antiobesity beliefs based on the BAOP. This finding is in slight contrast to other studies that have found more negative attitudes to be associated with stronger antiobesity beliefs.<sup>73</sup> The presence of antiobesity attitudes in this study population is consistent with previous studies reporting negative attitudes and bias toward obese patients among medical students,<sup>42-45</sup> other health professional students,<sup>16,21,67</sup> and health care providers.<sup>12-17</sup> Previous studies report that many health care providers support stereotypes that obese individuals are (for example) lazy and lack self-control<sup>74</sup> and tend to perceive obese patients as being noncompliant and unmotivated.<sup>75</sup> Such beliefs and attitudes can negatively impact the clinical encounter, including eliciting negative and stigmatizing behaviors by the provider<sup>23</sup> and provoking negative interactions from the patients themselves.<sup>76</sup> While this study found antiobesity attitudes to be present, mean scores on the BAOP suggested that the belief that obesity was controllable or that obese individuals are lazy or lacking in self-control appeared to be less common.

This study also found that DC students demonstrated significantly more positive attitudes and beliefs toward obese persons than did preclinical DC faculty. These data suggest that the negative beliefs and attitudes of preclinical

faculty do not appear to affect the students as they progress through their training. Although future studies are needed to elucidate this finding, this may be impacted by generational differences. Additionally, as compared with studies of medical students using the BAOP,<sup>77</sup> the mean scores of the DC preclinical and clinical students (31.68 and 31.26, respectively) were nearly double the mean of 17.5 reported in second- and fourth-year medical students, suggesting fewer antiobesity beliefs among DC students.

It is interesting to note that, by using other methodologies, a decline in empathy has been reported in allopathic medical students as they progress through their training,<sup>52–54</sup> but this was not observed in this study population. Reduced empathy has been associated with bias<sup>78</sup> and harboring stereotypes.<sup>79</sup> Some studies have suggested that medical students may be inclined to develop cynicism and experience dehumanization of patients as they progress in their training,<sup>53</sup> but this has not been studied in DC students. It is important to note that when using the BAOP scale specifically, Ip et al<sup>77</sup> did not observe differences in second- and fourth-year medical students; however, with the low scores reported (mean of 17.5), this may be attributable to a ceiling effect.<sup>77</sup>

The clinical implications of antiobesity attitudes among preclinical and clinical DC students and faculty are considerable. Over 640 million people are obese worldwide, and 44% of adults are predicted to be obese in the United States within the next decade.<sup>28</sup> It is well-established that weight bias among health care providers has a detrimental effect on patient care and outcomes,<sup>58</sup> and since chiropractic is the largest complementary and alternative medicine profession in the United States,<sup>66,67</sup> this can have widespread and damaging effects on public health.

A need for interventions to reduce negative attitudes and enhance understanding about the causes of obesity as students progress through their training is critical. Training for faculty is also essential to prevent the effect of a hidden curriculum and to support effective role-modeling. In general, a greater emphasis needs to be placed on intentionally enhancing learning in the affective domain. Respect for patients is a well-established feature of professionalism in medical education,<sup>80</sup> but is it being taught or is its presence merely being assumed? Professionalism has been established as a key competency among most health care professions, but most educational programs appear to use a more punitive approach rather than one that objectively enhances personal development. Teaching professionalism has been recognized as a challenge in health care education.<sup>81</sup> It is not easily placed within the objective paradigm that supports other health care competencies, it is challenging to describe and assess, and some professional development programs embedded within medical curricula have been described by some medical students as being “soft” and even “useless.”<sup>82</sup>

Traditionally, teaching many of the characteristics of professionalism has been relegated to role-modeling rather than by formal instruction and assessment. With the prevalence of antiobesity attitudes among faculty reported in this study and with findings from previous research

reporting students witnessing lapses in professionalism among faculty and clinical supervisors during both clinical and preclinical training,<sup>83</sup> this may no longer serve as a sufficient solution as it may leave students vulnerable to negative effects of the hidden curriculum.<sup>84,85,52</sup> It is no longer adequate to assume these qualities are being developed in future health care providers merely through clinical immersion. Furthermore, the punitive and behavior-focused approach to professionalism common in many academic institutions, where students displaying “unprofessional” behaviors are punished, is also inadequate as it does not identify the presence of bias or negative attitudes or intentionally and explicitly foster positive attitudes and values.<sup>82</sup> Students need to learn how to identify and critically challenge conventional stereotypes as well as their own preexisting biases and be able to resist the potential for negative influence. Teaching professionalism to mitigate obesity bias and antiobesity attitudes/prejudice should involve clearly defined objectives and intentional learning activities to develop appropriate values and attitudes. Competencies focused on cultivating positive attitudes and increasing awareness, empathy, and knowledge to reduce weight-based stereotypes need to be developed and embedded into the DC curriculum to intentionally teach, develop, and assess the positive attitudes and affects that are integral to the professionalism that define health care providers.

### Limitations

A limitation of this survey was the high margin of error for faculty, which may affect the reliability of the findings. However, the response rate was still within an acceptable standard.<sup>86,87</sup> Other limitations are those that are common to most survey studies. Sampling errors may be present as it is unclear if those who responded are perfectly representative of the populations from which they were selected, and thus it is uncertain if the findings are truly transferable. Additionally, different respondents may interpret questions differently and thus respond differently. An attempt was made to minimize limitations by taking steps to minimize social desirability bias and by using survey instruments that were already validated. However, the survey instrument itself may still have limitations as some questions appear to assess knowledge more than attitudes. For example, one of the strongest results on the BAOP was for the statement: “Obese people are just as healthy as nonobese people.” Compelling research indicates that obesity *is* linked to more adverse health outcomes.<sup>88–91</sup> Yet, based on the survey instrument, a high score on this statement suggested a less favorable attitude toward obesity or harboring obesity stereotypes; but perhaps more accurately, it reflected higher knowledge of the impact of obesity on health and its link to increased risk of all cause and cause specific mortality.<sup>91</sup> Using this instrument among a lay audience may be different from when it is used for current or future health care providers and educators. Therefore, for this study population, eliminating that question might improve the validity of the survey instrument.

Finally, it is important to recognize that while this study gathered data on prejudice and stereotypes harbored by

the study population, the methodology used does not capture information regarding actual behaviors. Future observational or survey studies should assess the effects of such attitudes on CIM patients.

### Considerations for Future Efforts

It is not easy to change attitudes and bias. Confirmation bias, the tendency to embrace ideas that reinforce existing biases and to disregard those that contradict them, is human nature. Intentional and explicit efforts are needed in integrative health care education to reduce the prevalence and mitigate the effects of obesity bias. Select interventions have been proposed to help resolve this problem during preclinical and clinical training. Swift et al<sup>92</sup> and Poustchi et al<sup>93</sup> used a video intervention for medical students and found it to be feasible and to have a lasting effect on beliefs, stereotypes, and attitudes toward obese individuals. Another study found that a short, one-time learning activity that integrated obese standardized patients and assigned readings had lasting benefits on attitudes and empathy at 1 year out, but not as much on stereotyping, which benefited in the short term but not long term.<sup>94</sup> The authors suggested that this may have been impacted by the negative influence of stereotypes promoted by clinical faculty, which speaks to the importance of aligning student learning with faculty development efforts. The next step of this research will be to determine whether an intervention targeted at reducing obesity bias among DC students and faculty can help improve antiobesity attitudes. A quantitative, pre- and posttest experimental design study will be used, with a follow-up survey administered in person 6 weeks after the intervention to see if effects are maintained.

### CONCLUSION

Obesity bias is common among clinical and preclinical chiropractic students and faculty at an academic integrative health care institution, which may lead to detrimental effects on patient care. Faculty development programs may be an effective solution to mitigate antiobesity attitudes and weight-based stereotypes to prevent the emergence of a hidden curriculum and to support effective role-modeling in the clinical and preclinical DC curriculum. To address weight-based stereotypes directly, specific competencies focused on cultivating positive attitudes and increasing awareness, empathy, and knowledge could be developed and embedded in the DC curriculum to intentionally teach, develop, and assess the positive attitudes and affects that are integral to the professionalism that define health care providers.

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### Author Contributions

Concept development: GK. Design: GK. Supervision: GK. Data collection/processing: GK. Analysis/interpretation: GK, HGT. Literature search: GK. Writing: GK. Critical review: GK, HGT.

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