



Authors: Brandon Worth, D.O., Colony Fugate, D.O.

CENTER FOR HEALTH SCIENCES

## INTRODUCTION

Stigma against persons suffering from obesity is prevalent. Weight-based bias, stigma, and discrimination extend from early childhood into adulthood and are experienced in multiple settings including interpersonal relationships, the media, and the school or workplace (4). Numerous studies show weight bias and stigma, common among those training in medical fields as well as those working in medical settings, negatively impacts patient care and health outcomes (1,2,3). In response, medical schools have developed curricula to educate students on obesity and weight bias.

## OBJECTIVES

To determine if medical students exhibit explicit or implicit weight bias and if evidence based curricula in obesity medicine had an effect on weight bias.

## METHODS

Students enrolled in the Obesity Medicine Focus Course at OSUCHS are routinely assessed for implicit and explicit bias using an implicit association test (IAT) and a 16-item questionnaire developed by Kushner, et al prior to and following curriculum exposure (5,6).

Our study was a retrospective data analysis of three years of medical student responses on IAT and 16-item questionnaires. We assessed for student explicit and implicit bias as well as change in implicit bias after curriculum exposure.

### Test 3 (6)

### Test 4 (6)

Fat People Fat obese large Bad terrible awful horrible	Thin People slim skinny tiny Good wonderful joyful beautiful	Fat People Fat obese large Bad terrible awful horrible	Thin People slim skinny tiny Good wonderful joyful beautiful	Fat People Fat obese large Bad terrible awful horrible	Thin People slim skinny tiny Good wonderful joyful beautiful	Fat People Fat obese large Bad terrible awful horrible	Thin People slim skinny tiny Good wonderful joyful beautiful
<input type="radio"/> obese <input type="radio"/> slim <input type="radio"/> enormous <input type="radio"/> large <input type="radio"/> tiny <input type="radio"/> joyful <input type="radio"/> sad <input type="radio"/> wonderful <input type="radio"/> awful <input type="radio"/> happy <input type="radio"/> miserable	<input type="radio"/> terrible <input type="radio"/> nice <input type="radio"/> fat <input type="radio"/> thin <input type="radio"/> awful <input type="radio"/> beautiful <input type="radio"/> horrible <input type="radio"/> good <input type="radio"/> bad <input type="radio"/> amazing <input type="radio"/> terrible	<input type="radio"/> obese <input type="radio"/> slim <input type="radio"/> enormous <input type="radio"/> large <input type="radio"/> tiny <input type="radio"/> joyful <input type="radio"/> sad <input type="radio"/> wonderful <input type="radio"/> awful <input type="radio"/> happy <input type="radio"/> miserable	<input type="radio"/> terrible <input type="radio"/> nice <input type="radio"/> fat <input type="radio"/> thin <input type="radio"/> awful <input type="radio"/> beautiful <input type="radio"/> horrible <input type="radio"/> good <input type="radio"/> bad <input type="radio"/> amazing <input type="radio"/> terrible	<input type="radio"/> obese <input type="radio"/> slim <input type="radio"/> enormous <input type="radio"/> large <input type="radio"/> tiny <input type="radio"/> joyful <input type="radio"/> sad <input type="radio"/> wonderful <input type="radio"/> awful <input type="radio"/> happy <input type="radio"/> miserable	<input type="radio"/> terrible <input type="radio"/> nice <input type="radio"/> fat <input type="radio"/> thin <input type="radio"/> awful <input type="radio"/> beautiful <input type="radio"/> horrible <input type="radio"/> good <input type="radio"/> bad <input type="radio"/> amazing <input type="radio"/> terrible	<input type="radio"/> obese <input type="radio"/> slim <input type="radio"/> enormous <input type="radio"/> large <input type="radio"/> tiny <input type="radio"/> joyful <input type="radio"/> sad <input type="radio"/> wonderful <input type="radio"/> awful <input type="radio"/> happy <input type="radio"/> miserable	<input type="radio"/> terrible <input type="radio"/> nice <input type="radio"/> fat <input type="radio"/> thin <input type="radio"/> awful <input type="radio"/> beautiful <input type="radio"/> horrible <input type="radio"/> good <input type="radio"/> bad <input type="radio"/> amazing <input type="radio"/> terrible

## ACKNOWLEDGEMENTS

Dr. Mark Payton, statistical analysis and methodological support

## RESULTS

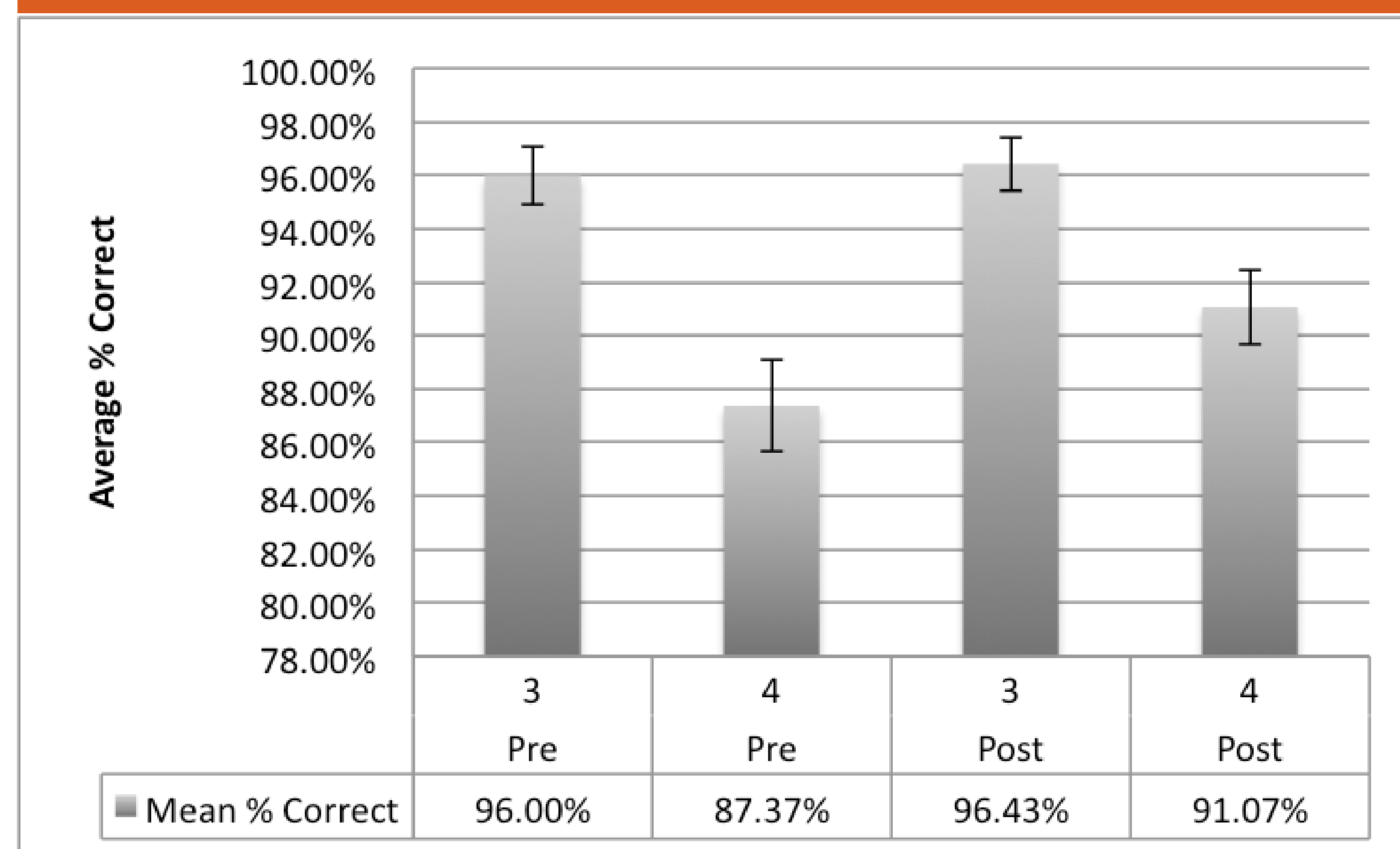


Figure 1: Test 3/4 pre-course vs post-course average percent correct. p-value of pre-course test 3 and 4 0.0008 and Post-course test 3 and 4 <0.0001

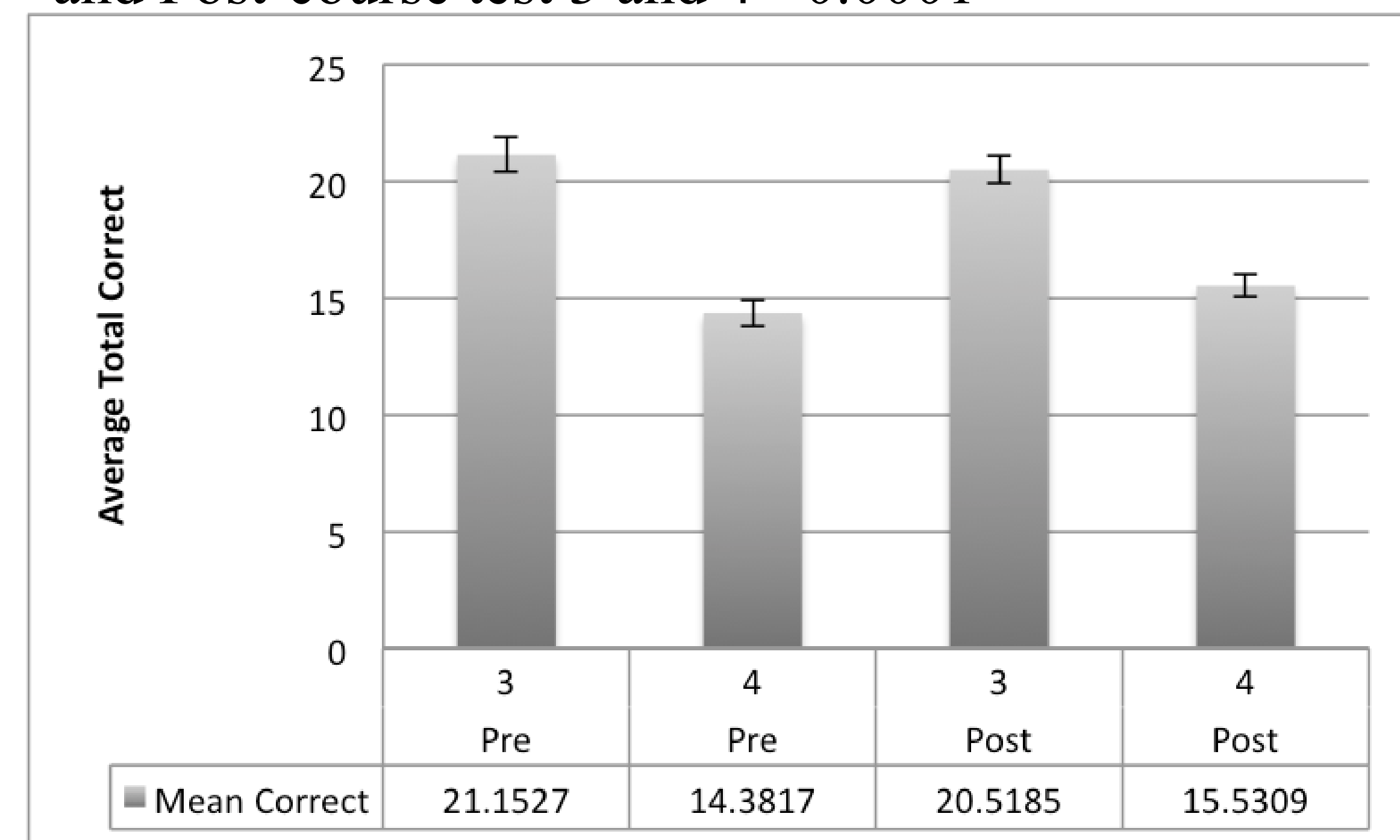


Figure 3: Pre-course vs post-course average total correct answers. p-value of both pre/post-course test 3 and 4 <0.0001

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Obese individuals have lower will power than non-obese individuals					
Individuals are obese due to making poor personal choices					
Life events and our environment make weight loss difficult					
Obesity is complex, due to genetic, biology, and behavior					
Obese individuals are lazier than non-obese individuals					
Obese people are more emotional than non-obese individuals					
Obese individuals don't make good decisions					
Obese individuals have themselves to blame					
Obese individuals are generally not assertive enough					
Obese people feel stigmatized in our society					
Obese people feel stigmatized by the medical profession					
Very few obese are ashamed of their weight					
I am uncomfortable being around obese people					
I am comfortable talking to people about their weight					
I know what meaningful questions to ask to take a body weight history					
I know what meaningful questions to ask to help obese people manage their weight					

16-item questionnaire (6)

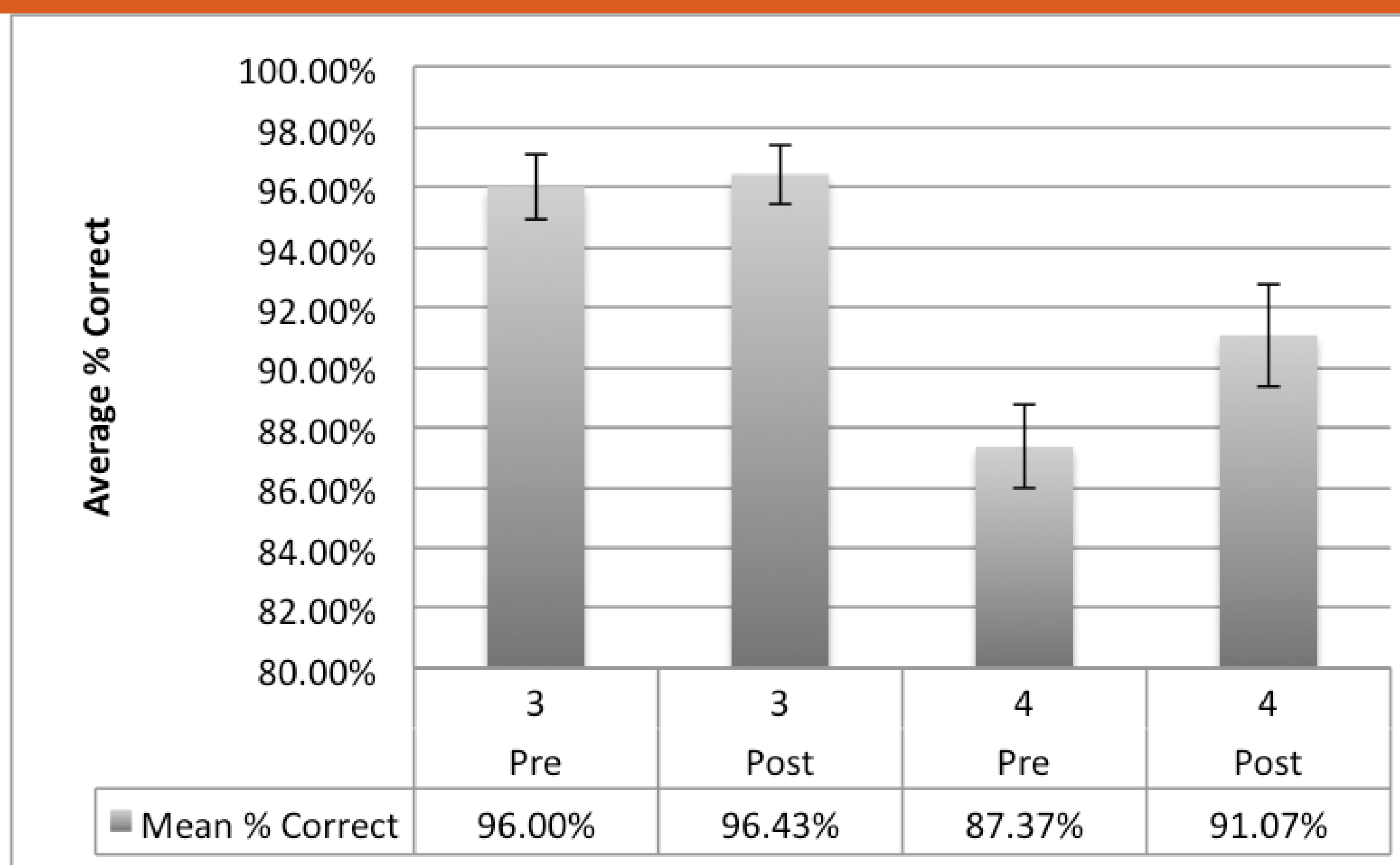


Figure 2: Test 3 pre/post vs test 4 pre/post average percent correct. p-value of pre/post-course test 3 0.9175 and pre/post-course test 4 0.0497

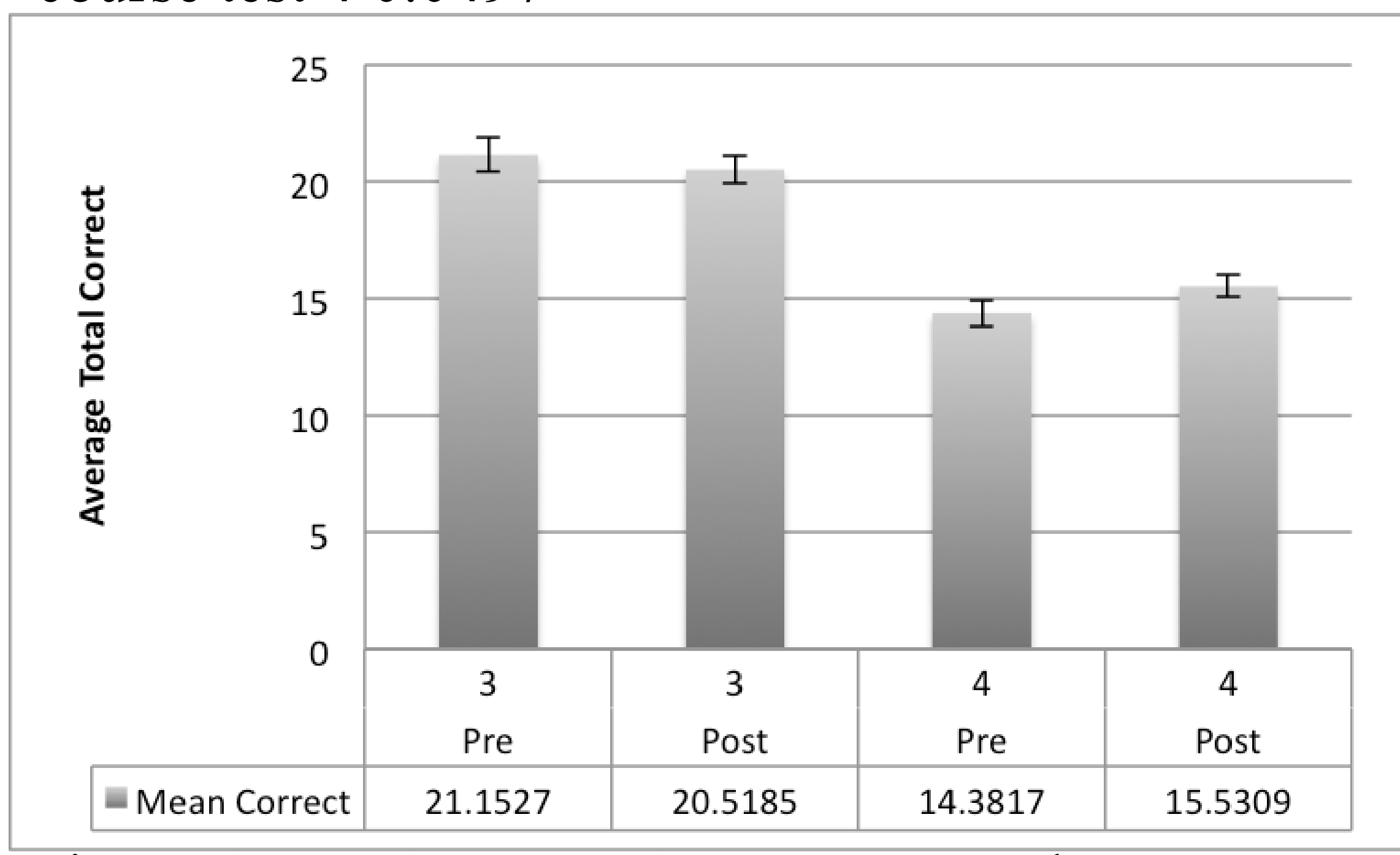


Figure 4: Test 3 vs Test 4 pre-course and post-course average total correct answers. p-value of pre/post-course test 3 of 0.5050 and pre/post-course test 4 of 0.1262

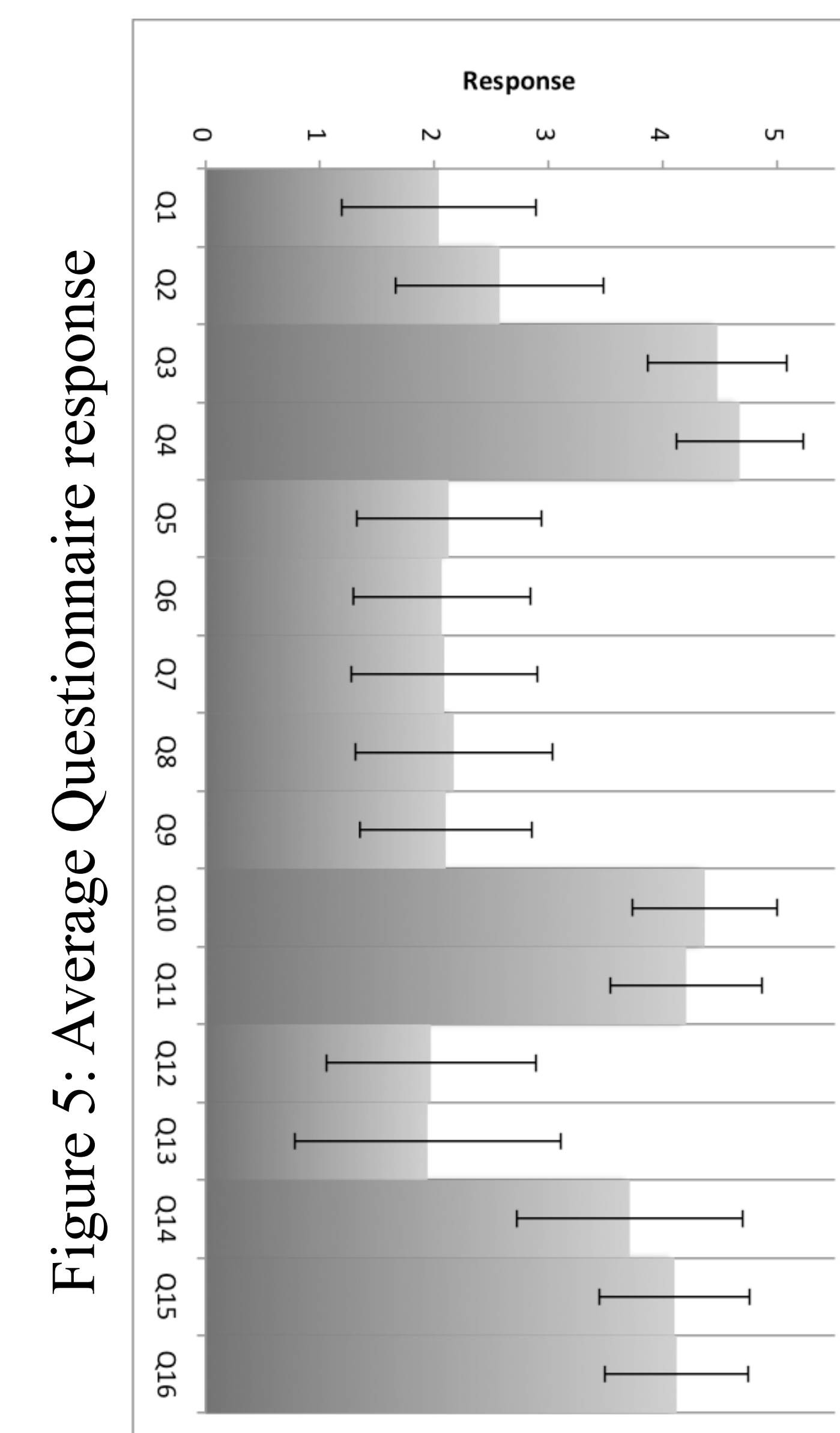


Figure 5: Average Questionnaire response

## CONCLUSION

Our results indicate that, although students have low explicit bias, students exhibited implicit bias. However, course curricula had a statistically significant impact on reducing implicit bias.

## DICUSSION

Overall data was promising and showed that students' implicit bias appeared to be decreased and that the explicit bias scored on the 16-item questionnaire had favorable responses.

One strength of the study is that data appears to further validate the IAT and the 16-item questionnaire. However, we did encounter problems with data collection which may have impacted the results including a large number of IATs that could not be linked and a large number of students opting out of the IAT (either pre/post or both) due to not attending class in person. Further, previous unpublished data shows that not all students view presentations when not attending class. Therefore, actual content received by students cannot be measured. Further, due to software limitations, explicit bias could not be measured and match on a pre/post course basis. Thus, the impact of the course on explicit bias could not be evaluated.

Findings suggest curricula had a positive effect student implicit bias. While these findings were seen in the immediate timing of the course, it would be worth following the students and testing over their progression through medical school to see if it has lasting effects.

## REFERENCES

1. Cavaleri, Rocco, et al. "Weight Stigmatization in Physiotherapy: a Systematic Review." *Physical Therapy Reviews*, vol. 21, no. 1, Feb. 2016, pp. 1–9., doi:10.1080/10833196.2016.1213976.
2. Mulherin, Kate, et al. "Weight Stigma in Maternity Care: Women's Experiences and Care Providers' Attitudes." *BMC Pregnancy and Childbirth*, vol. 13, no. 1, 2013, doi:10.1186/1471-2393-13-19.
3. Miller, David P., et al. "Are Medical Students Aware of Their Anti-Obesity Bias?" *Academic Medicine*, vol. 88, no. 7, 2013, pp. 978–982., doi:10.1097/acm.0b013e318294817.
4. Puhl, R. M., and K. D. Brownell. "Psychosocial Origins of Obesity Stigma: toward Changing a Powerful and Pervasive Bias." *Obesity Reviews*, vol. 4, no. 4, 2003, pp. 213–227., doi:10.1046/j.1467-789x.2003.00122.x.
5. Robert F Kushner, et al. "An Obesity Educational Intervention for Medical Students Addressing Weight Bias and Communication Skills Using Standardized Patients." *BMC Medical Education*, BioMed Central, 18 Mar. 2014.
6. Teachman, Ba, and Kd Brownell. "Implicit Anti-Fat Bias among Health Professionals: Is Anyone Immune?" *International Journal of Obesity*, vol. 25, no. 10, 2001, pp. 1525–1531., doi:10.1038/sj.ijo.0801745.