

# STUDENTS' BODY IMAGE PERCEPTIONS AFTER COMPLETION OF AN ANATOMY COURSE

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## ABSTRACT

A descriptive observational study was conducted among undergraduate medical students to determine whether the knowledge of Anatomy influenced their body image perceptions. The perception of some students regarding their body image and appearance was different after the course, and also their view of other peoples' bodies. The findings of the study support the literature that males are more concerned with muscularity and developing muscles, whereas females are more preoccupied with thinness. The study showed that a course in Anatomy might have an influence on students' perceptions of their own and other peoples' physical appearance.

**Keywords:** anatomy, body image; muscularity; thinness; physical appearance; perception

## 1. INTRODUCTION

People's concerns about their body image have increased markedly over the past few decades, and more and more individuals, especially adolescents and young adults, are increasingly dissatisfied with their own physical appearance (Daniel & Bridges, 2010).

It is well-known that the media influences the way in which male and female persons see themselves and individuals of the opposite gender. The two most common issues are thinness and muscularity (Daniel & Bridges, 2010; Frederick, Fessler & Haselton, 2005; Hargreaves & Tiggemann, 2004; Hargreaves & Tiggemann, 2009; Labre, 2002). Women's body image relates mostly to being acceptably thin, whereas men's body image relates to being satisfactorily muscular (Ginis et al., 2005). Furthermore, women are more concerned with physical attractiveness, while men are more preoccupied with strength, stamina and agility (Ginis et al., 2005). Another aspect of body image that receives attention is leanness, and a drive for leanness can be regarded as the desire for "low body fat and toned, physically fit muscles" (Smolak & Murnen, 2008). However, the drive for leanness might be difficult to differentiate from both the drive for muscularity and the drive for thinness, and it is not easy to test this separately from muscularity and thinness, although attempts to do so have been reported in the literature (Smolak & Murnen, 2008). It was also noted that a person's drive for muscularity, whether male or female, might be associated with one's general body image, weight and muscles (McCreary & Saucier, 2009).

However, not only the media, but also other biopsychosocial influences such as personality, depression and peer influences have an effect on how people see themselves (Davis, Karvinen & McCreary, 2005; Grammas & Schwartz, 2009; McCabe, Ricciardelli, Sitaram & Mikhail, 2006; Morrison, Morrison & Hopkins, 2003). In males, it has also been shown that exercise dependence may serve as a drive for muscularity (Hale et al., 2010). Even positive or negative comments from other people on one's body appearance could result in dissatisfaction with one's own body and a drive for muscularity, especially among men (Nowell & Ricciardelli, 2008). Self-objectification might also play a tremendous role in how people perceive their own bodies. This theory stipulates that a person sees him- or herself as an object which is evaluated on the basis of appearance instead of personhood. Such individuals survey their own bodies constantly from the perspective of an external observer, and they compare their own bodies to the ideal body (Daniel & Bridges, 2010). Self-objectification is obviously also an important factor in distorted body images, especially in women, but also in men (Smolak & Murnen, 2008).

A drive for muscularity or thinness, or even a pure dissatisfaction with one's own body, might encourage individuals to adopt a more active lifestyle with regard to participation in sport and exercise (Hale et al., 2010; Smolak & Murnen, 2008). People may, however, adopt unhealthy strategies to address their dissatisfactory body images, and incur several risks along the way such as unhealthy eating patterns (Kelley, Neufeld & Musher-Eizenman, 2010; Smolak & Murnen 2008). People may also develop emotional and psychological consequences due to dissatisfaction with their physical appearance, such as social physique anxiety (Daniel & Bridges, 2010; Kelley et al., 2010; McCreary & Saucier, 2009).

Attempts have been made to support university students with regard to a positive body image by following structured health education programmes. One example is the programme followed at three Canadian universities, using amongst others, cognitive therapy, self-esteem enhancement strategies and stress management skills (McVey et al., 2010). Other means of support include a strength training course, which proved to enhance body image in both male and female individuals (Ginis et al., 2005).

Several measuring instruments relating to body image are available in the literature and attempts have been made to standardise these measuring instruments. Some of these instruments include the Body Areas Satisfaction Scale (BASS) of the Multidimensional Body-Self Relations Questionnaire (MBSRQ) (Brown, Cash & Mikulka, 1990); the Drive for Muscularity Scale (DMS) which is used to determine muscularity satisfaction and concerns (McCreary & Sasse, 2000); the Somatomorphic Matrix (Cafri & Thompson, 2004; McCreary, Sasse, Saucier & Dorsch, 2004); and the Physical Self-Description Questionnaire (PSDQ) to assess, amongst others, perceived body fatness (Marsh et al., 1994).

In spite of all the research done on body image, no studies have been found in the literature which examined the influence of an Anatomy course on the body image of university or college students. Since these students obtain "inside information" about how a person's body is put together structurally, the position of muscles in the body and the appearance of a muscular body, this might influence the way in which they perceive their own bodies, and possibly also encourage them to modify their lifestyle in order to obtain an "anatomical body".

The aim of this study was therefore to explore whether the completion of an Anatomy course in the Department of Basic Medical Sciences, Faculty of Health Sciences at the University of the Free State (UFS) in Bloemfontein, South Africa, had in any way influenced students' perception of their body image. Not only a general perception about the students' body image was examined, but also more detailed information about their perceptions of change in their weight and muscularity, as well as attempts made to improve their physical appearance.

## **2. METHODS**

The target population for this study was the undergraduate second-year medical students at the UFS who completed the dissection programme in 2011 presented by the Department of Basic Medical Sciences.

A questionnaire was compiled for the purpose of this study, and was specifically aimed at the perceptions of students about the influence of knowledge of Anatomy on their body image. None of the existing questionnaires available in the literature seemed to be suitable for this investigation. However, the two aspects of body image that received most attention in the literature, namely body weight and muscularity, were the main focus of the questionnaire. Since the drive for thinness and muscularity might occur simultaneously in a single individual and not necessarily males and females respectively (Kelley et al., 2010), both these aspects were included in the questionnaire used in the study, and specific questions elaborated on these two aspects of body image. Due to the difficulty in separating leanness clearly and unambiguously, no separate items on body leanness were included in the questionnaire. In order to allow comparison between different student groups from a demographic perspective, information with regard to race, gender and age was requested at the end of the questionnaire.

The study was approved by the Ethics Committee, Faculty of Health Sciences, UFS. All the necessary permissions were obtained, and the questionnaire was first piloted. Data from the pilot study were not included in the actual study data.

The questionnaire was made available in English and Afrikaans, since a parallel medium approach to instruction is followed at the UFS.

Each class of students was approached after an Anatomy class and informed about the study. They were requested to participate in the study, and an information document containing the purpose of the study, as well as the implications for participation and ethical considerations for the study, was handed out to them. Thereafter, they had the opportunity to complete the questionnaire voluntarily and anonymously. The questionnaires were collected directly after completion to improve the response rate.

The intention of this study was purely to obtain information regarding the perceptions of students about the influence of Anatomy on their body image. Therefore, the study did not entail the distribution of questionnaires before and again after completion of the Anatomy course, but rather required students to reflect on their perceptions from before and after the course. The open-ended questions were analysed and similar responses to a particular item in the questionnaire were categorised to summarise the different opinions.

### 3. RESULTS

#### 3.1 Demographic information

A total of 130 students out of the 159 students in the second-year medical class completed the questionnaire. The four students who participated in the pilot study were not included in the main study and therefore, the response rate was 83.9% (130/155). With regard to the distribution of students based on language preference, 71 (54.6%) students were in the Afrikaans and 59 (45.4%) in the English class. In total, 63 male (48.5%) and 67 female (51.5%) students participated in the study.

The students' age was distributed across a relatively wide range (18–34 years). The mean and median ages of the group were 20.5 and 20 years, respectively. The outliers at the top end of the age spectrum were two students who were 33 and 34 years of age. Were they to be excluded, the oldest student would be 26 years of age. Figure 1 demonstrates the representation of different racial groups, with the majority of students (74.4%) being White.

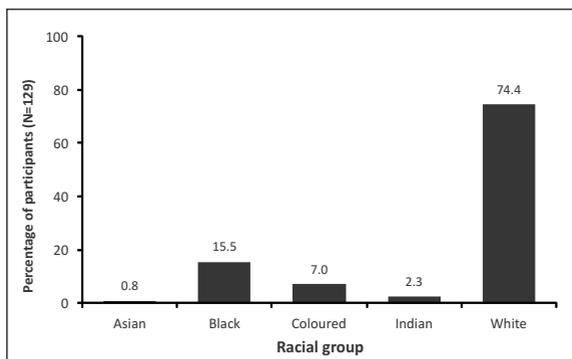


Figure 1. Distribution of population groups among students (N=129).

### 3.2 Responses regarding the students' body image, appearance and body weight

Of the 130 students who participated in this study, 60.8% (n=79) indicated that a course in Anatomy did indeed influence their image of their own bodies. Students were asked to recall how they saw themselves before they started the course, and then to report how they saw themselves at the time of completion of the questionnaire, which was at the end of the course. As shown in Table 1, their responses varied from seeing themselves as being underweight to being overweight, and also from being muscular to non-muscular. The opinions of students that did not differ with regard to body image before and after the course are indicated in the shaded cells in Table 1, and those whose perception that their body image differed substantially between before and after the course, are indicated in bold. More than half (51.7%) of the participants' responses did not show any difference in body image perception before and after the course. Ten students regarded themselves as being overweight (either muscular or non-muscular) before the course, and of normal weight after the course. The opposite was also found, with six students regarding themselves as being normal weight (either muscular or non-muscular) before the course, but as overweight after the course.

Table 1: Comparison of students' perceptions regarding their body image before and after an Anatomy course (N=120).

		After course							Total (%)
		Under - weight	Thin but not muscular	Thin and muscular	Normal weight but not muscular	Normal weight and muscular	Over-weight but not muscular	Overweight and muscular	
Before course	Underweight		1						1 (0.8)
	Thin but not muscular		4	1	2	1			8 (6.7)
	Thin and muscular	1	1	4	1	2			9 (7.5)
	Normal weight but not muscular		3	2	30	11	1	1	48 (40.0)
	Normal weight and muscular		1	5	5	12	1	3	27 (22.5)
	Overweight but not muscular				4	3	6	2	15 (12.5)
	Overweight and muscular					3	3	6	12 (10.0)
	Total (%)	1 (0.8)	10 (8.3)	12 (10.0)	42 (35.0)	32 (26.7)	11 (9.2)	12 (10.0)	120 (100)

Despite the fact that 79 (60.8%) students were of the opinion that their body image had been influenced by Anatomy as a subject, less than half (n=56; 43.4%) of the participants perceived that their body's appearance had changed since taking Anatomy. With regard to gender, 50.8% of the male students (n=32), as opposed to 36.4% of the female students (n=24), thought that their body appearance was different since taking Anatomy.

On asking how they thought their body appearance had changed, 16 different responses were given, as summarised in Table 2. Several students provided more than one answer. An attempt was made to separate the positive and negative reasons given for a changed perception of body appearance in this table. Comments made by male and female students are shown separately for comparative purposes. Most students indicated that either becoming more muscular or thinner (losing weight) were positive reasons for a self-reported altered body appearance, while the majority of students regarded the gain of weight or body fat as the leading negative reason for seeing themselves differently. However, more male students commented about their muscles; for example, 16 of the male students, as opposed to four female students, reported they had become more muscular. More female than male students commented on their body weight [for example, lost weight (n=8) or body weight fluctuated (n=2)]. These comments are indicated in bold in Table 2 for clarity. The same number of male and female students (both n=3) noted that they gained weight (increased fat). Some students provided answers which were not related to having Anatomy as a subject at all (for example, dressed neater for class), but these comments were included in the table nevertheless for comprehensiveness.

Table 2: Reasons for a changed perception of body appearance.

	Male	Female	Total	% (n=56)
<b>Positive reasons</b>				
More muscular/bigger	16	4	20	35.7
Thinner (lost weight)	6	8	14	25.0
Look generally good (improved)	5	1	6	10.7
Firmer (toned)	1	3	4	7.1
Healthier	1	3	4	7.1
More self-confidence because body is so wonderfully made	1	1	2	3.6
Became older, more mature	2	0	2	3.6
Fitter	0	1	1	1.8
Do more exercise	1	0	1	1.8
See individual muscles in body	0	1	1	1.8
Stopped smoking	0	1	1	1.8
Dress neater for class	0	1	1	1.8
<b>Negative reasons</b>				
Increase in fat	3	3	6	10.7
Body weight fluctuates (up and down)	0	2	2	3.6
Look worse	0	1	1	1.8
Smaller muscle mass	1	0	1	1.8
<b>No reason provided</b>	1	0	1	1.8

Figure 2 demonstrates the responses of students with regard to body image compared with those concerning body appearance. The majority of students who perceived a change in body image also had the same perception about their body appearance. On the other hand, almost 25% of the students who did not think that their body image had been influenced by Anatomy, actually thought that their body appearance had changed. This difference in proportions was found to be statistically significant, as demonstrated by a chi-square test ( $\chi^2=12.52$ ,  $df=1$ , Fisher's exact probability  $< 0.005$ ).

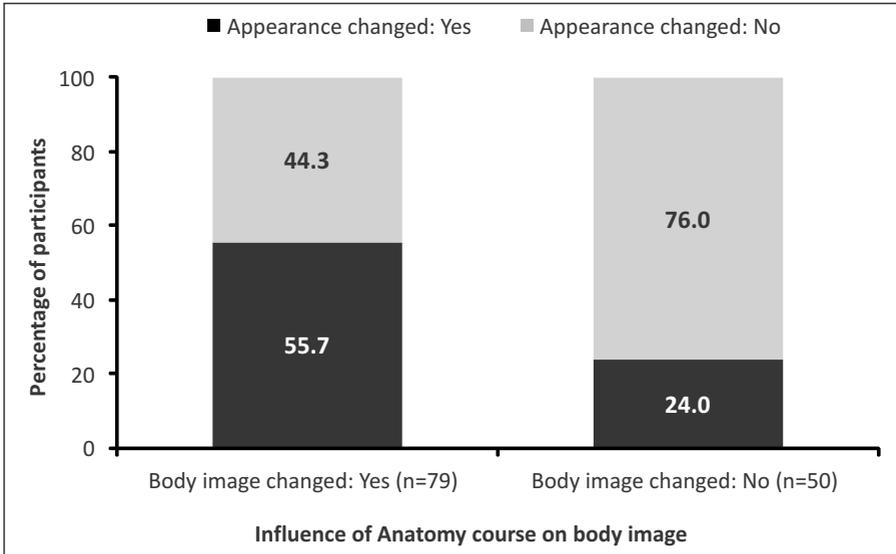


Figure 2. Comparison of participants' responses with regard to body image and body appearance.

Students were also asked whether they thought their body weight had changed since taking Anatomy, and if so, whether it had increased or decreased. Additionally, they were asked to provide possible reasons for the change in weight. Slightly more than half of the students (51.5%,  $n=67$ ) indicated that their body weight had changed. One student noted that there was a fluctuation in body weight and did not specifically indicate whether it had increased or decreased. Of the other 66 students, 36 students (54.5%) stated that their body weight had decreased, of which 22 were female and 14 male. Thirty students (45.5%), of which 20 were male and 10 female, experienced an increase in body weight. Thus, 32.8% of all the female students had a decrease in body weight, as opposed to 31.6% of all the male students who reported an increase in body weight.

Several different answers were provided as to why their body weight had changed, and some students provided more than one reason.

Table 3 provides insight into the reasons given by participants for changes in body weight. Reasons provided by male and female students are indicated separately to allow comparison. The majority of students attributed a decrease in weight to a healthy diet and/or exercise. Most students experienced an increase in body weight due to either exercise with weights, which was the reason given mostly by male participants, or an inactive lifestyle.

Table 3. Participants' reasons for changes in body weight.

	Male	Female	Total	% of total
<b>Reasons for decreased weight (n=36)</b>				
Healthy eating plan	7	11	18	50.0
More exercise	6	11	17	47.2
Stress	2	3	5	13.9
Gym with weights	2		2	5.6
Unhealthy diet	1	1	2	5.6
Not necessarily due to Anatomy		2	2	5.6
Eat less		2	2	5.6
Exercise that tones the body		1	1	2.8
More active	1		1	2.8
Participation in sport		1	1	2.8
Beneficial to maintain normal body weight		1	1	2.8
Less active due to studies		1	1	2.8
Drink water		1	1	2.8
Keep journal of eating and weight	1		1	2.8
More knowledge of body			1	2.8
Healthy lifestyle		1	1	2.8
Less sport due to injury	1		1	2.8
Staying in hostel		1	1	2.8
Increased metabolism	1		1	2.8
<b>Reason for increased weight (n=30)</b>				
Gym with weights (increased muscle mass)	9	1	10	33.3
Less active due to studies	4	3	7	23.3
Junk food; unhealthy diet	1	4	5	16.7
Eat more	3	2	5	16.7
Stress		3	3	10.0
More interest in own body	1		1	3.3
Getting married		1	1	3.3
Healthy lifestyle	1		1	3.3
Normal development	1		1	3.3
More exercise	1		1	3.3
<b>No reason provided</b>			2	6.7

Students were specifically requested to indicate whether they had made any intentional attempts to improve their bodily appearance, for example, by developing certain muscles. Forty-seven (36.4%) students indicated that they made an effort to develop their muscles since they had taken Anatomy. However, when the responses of the male and female students were compared, it was found that many more of the male students than females attempted to develop their muscles, as demonstrated in Figure 3. This difference between the gender groups was statistically significant, as determined by a chi-square test ( $\chi^2=12.52$ ,  $df=1$ , Fisher's exact probability < 0.05).

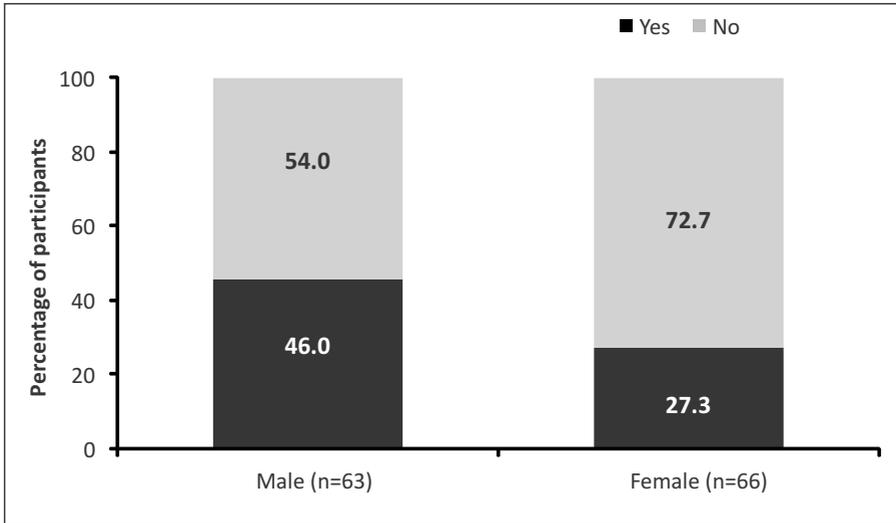


Figure 3. Male and female responses with regard to intentional efforts to develop muscles.

### 3.3 Responses regarding the image of other people's bodies

Most students ( $n=81$ ; 62.3%) indicated that a course in Anatomy influenced the way they viewed other people's bodies. Again, several different reasons have been provided for the perceived change in perception, as indicated in Table 4. Thirteen of the 30 reasons provided were related to the students' knowledge of Anatomy, while seven reasons were related to body fat composition (reasons were grouped together for clarity). Most reasons related to students' knowledge of Anatomy were associated with their knowledge of muscles, but other aspects also include surface anatomy, normal variation and abnormalities. The reasons provided for body fat composition showed that students were also aware of thinness and people being overweight. The responses of the male and female students are shown separately for comparison.

With regard to knowledge of Anatomy, both male and female students were aware of the muscles and physique of other people, but slightly more female students were also aware of abnormalities or painful muscles and surface anatomy. Although both male and female students were aware of the fat distribution and composition of other people, a slight affective element to some female students' commentaries was observed, which was lacking in the comments made by male students. Similar findings were made with regard to reasons not related to Anatomy knowledge and body fat.

Table 4: Reasons for a different perception of other people's bodies since taking Anatomy.

	Male	Female	Total	% (n=81)
<b>Reasons related to knowledge of Anatomy</b>				
Look at groups of muscles of persons (whether they are developed)	7	5	12	14.8
Look at build of persons' bodies/physique (attentive to it; critical)	6	4	10	12.4
Realise each person is unique and has differences (variation)	3	3	6	7.4
Pay attention to surface anatomy	2	4	6	7.4
Look less critical, but more anatomically at people	2	3	5	6.2
Detect when a person has an abnormality	1	3	4	4.9
Appreciate complexity of the human body	1	2	3	3.7
Look at muscles and attempt to identify them		3	3	3.7
Look at muscle development of different sportspersons		3	3	3.7
Appreciate importance of muscle tone for support		2	2	2.5
Compare them with perfect Anatomy structure	2		2	2.5
Notice when somebody has painful muscles, know the names of the muscles		1	1	1.2
Aware of differences between male and female internally	1		1	1.2
<b>Reasons related to body fat composition</b>				
Look more analytically at composition of muscle and fat amount	2	4	6	7.4
Overweight people should change their lifestyle (fat is ugly)	3	1	4	4.9
Notice whether they are normal, underweight or overweight	2		2	2.5
Do not see persons in terms of fat or thin		1	1	1.2
Feel sorry for persons who are overweight		1	1	1.2
Big or overweight people still have small muscles		1	1	1.2
Note the differences between males and females with regard to fat distribution	1		1	1.2
<b>Other reasons</b>				
Notice things that affect persons' bodies negatively	1	2	3	3.7
Understand why people look the way they look		3	3	3.7
Appreciate normality		1	1	1.2
See everyone in comparison with myself	1		1	1.2
People who are not in good condition can easily keep their bodies in good condition	1		1	1.2
Has respect for people who look after their bodies well		1	1	1.2
Notice when a person lives an unhealthy lifestyle	1		1	1.2
Relate eating habits to what people eat	1		1	1.2
Respect people more	1		1	1.2
Body is more complex due to the subconscious mind		1	1	1.2
<b>No reason provided</b>			3	3.7

## 4. DISCUSSION

Although 60.8% of the students indicated that a course in Anatomy had influenced their body image, 51.7% of the respondents did not view themselves as falling into different body image categories before and after the course (Table 1), and only 43.4% perceived a change in body appearance. Most students noted becoming more muscular or thinner as a positive reason for a perceived change in body appearance, and becoming fatter as a negative reason (Table 2). As noted, the male students made more comments about an increase or a decrease in muscle mass than the female students, whereas the female students were more preoccupied with body weight (lost or gained weight, and fluctuations in body weight). However, an equal number of male and female students noted an increase in their body weight. The majority of comments on self-reported change in body appearance were related to being thin and/or muscular, which corresponded to the literature reporting that muscularity and thinness are two important factors of body image (Ginis et al., 2005). This study therefore supports the argument that muscularity is an important aspect of body image especially for men. Many more male than female students also attempted to develop their muscles since having Anatomy (Figure 3), which once again corresponds to findings reported in the literature (Daniel & Bridges, 2010; Frederick, Fessler & Haselton, 2005; Ginis et al., 2005; Hargreaves & Tiggemann, 2004; Hargreaves & Tiggemann, 2009; Labre 2002).

From the students' responses as to why they perceived their physical appearance differently since having Anatomy, it was clear that certain students might be in danger of self-objectification (that is, evaluating their bodies on the basis of appearance and not personhood), as students might compare themselves to the ideal anatomical body (Daniel & Bridges, 2010). Although not within the scope of this article, a further direction of study might be to determine the body mass index (BMI) of the individual students and compare it with their body image categories, to determine whether their perceived body image is accurate or not.

Although it is obvious that a course in Anatomy would not be the only reason for students' change in body weight, the information obtained through this study provides useful insight into factors that influence students' body image and general health. It became evident that a substantial number of students realised the importance of a balanced, healthy diet and exercise. However, with reference to the results shown in Table 3, more female than male students lost body weight as a result of dieting and/or exercise, with 61.1% of the students who lost weight being female. On the other hand, many more male students conditioned themselves with weights in the gym to increase their muscle mass, and consequently also increased their body weight, with 66.7% of the students who gained weight being male.

The observed tendency for female individuals to lose weight and being concerned with thinness, and for male individuals to improve their muscularity, is supported by findings reported in the literature (Daniel & Bridges, 2010; Frederick, Fessler & Haselton, 2005; Ginis et al., 2005; Hargreaves & Tiggemann, 2004; Hargreaves & Tiggemann, 2009; Labre 2002).

Exercise and healthy diet are well-known essential aspects of body weight control and a healthy lifestyle (Bennett & Sothern, 2009), and it seems as if the undergraduate medical students at the University of the Free State are indeed aware of the benefits of exercise and healthy eating habits. It is, however, worrisome that stress and inactivity as a result of lack of time due to the demands of their studies, caused some students to lose weight (n=7) and others to gain weight (n=10) (Table 3). The Faculty of Health Sciences needs to consider the possibility of implementing support and counseling services for students with regard to time and stress management.

It was noteworthy to find that more students viewed other people's bodies differently than their own after having taken Anatomy as a subject (62.3% versus 60.8%, respectively). From the reasons why the students saw other people's bodies differently after the Anatomy course, it was evident that they became increasingly aware of the anatomical structure of the human body, as well as the fat composition in individuals. Once again, this observation was in line with the muscularity and thinness arguments proposed in the literature (Ginis et al., 2005; Kelley et al., 2010). It was also encouraging, from an Anatomical instructor's point of view, that some students were aware of the complexity of the human body, surface anatomy, variations and abnormalities. However, there is always a risk of "others-objectification", which by implication could lead to regarding other people as anatomical bodies that should be evaluated on the basis of appearance and not as a person. From the responses shown in Table 4 and the comparison between the comments of the male versus female students, it was found that the male students were slightly more at risk of noticing other persons' bodies purely on the basis of appearance. The female students' comments indicated an element of awareness of the psychological aspects of others. Instructors of Anatomy should thus be aware of this possibility and continuously remind students that they look at a person as a whole, and not only the outer body and its appearance.

## **5. CONCLUSION AND RECOMMENDATIONS**

Although a relatively small sample size was involved in this study, the focus of this study has been solely on the responses of second-year medical students of 2011 in the Faculty of Health Sciences, UFS. Other groups of students registered for Anatomy in the Department of Basic Medical Sciences, such as Occupational Therapy, Physiotherapy and Nursing, will also be included in a follow-up study in due course to increase the sample size and draw comparisons.

This might also improve the representation of the different population groups, as very little conclusions could be made from the responses given by students of different ethnicity, with the exception of the White students who represented the majority of the participants.

A further investigation could be done to assess students' perceptions of how other Anatomy students viewed their appearance, and whether they experienced any anxiety about their own physical appearance. This study could also be extended to test whether specific diet or eating patterns resulted from a possible change in body image. A further pre-post comparative study could also be conducted to test scientifically whether Anatomy as a subject did indeed change the image of students of their own bodies.

It is, however, essential to keep in mind that the visible physical appearance of individuals is only one factor that can influence body image (Ginis et al., 2005). Other psychological and social factors were beyond the scope of this study, and the focus was exclusively on the influence of knowledge of the Anatomy of the human body on students' body images.

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