

# Eating, drinking and physical activity in Faculty of Health Science students compared to other students at a South African university

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Keywords: dietary intake, alcohol consumption, physical activity, Health Sciences, university students

## Abstract

**Objectives:** Students studying towards a qualification in Health Sciences should have more knowledge of a healthy lifestyle than other university students. However, it has been questioned whether or not these students apply such knowledge. While studies have been conducted on the lifestyle habits of students in general, few have compared the practices of Health Science students with those of other students. The objectives of this study were to compare the eating patterns, alcohol consumption and physical activity of Health Science students with those of other students.

**Design:** A cross-sectional study design that utilised an electronic self-administered survey was applied. Data were analysed using SPSS® and Pearson's chi-square test ( $p$ -value < 0.050).

**Subjects and setting:** A convenience sample ( $n = 619$ ), consisting of registered students at Nelson Mandela Metropolitan University, participated, after providing informed consent.

**Outcomes measures:** Dietary patterns and frequency of intake, alcohol consumption and physical activity were measured.

**Results:** A statistical difference was not reported between the eating patterns, alcohol consumption and physical activity of Health Science students and those of other students. Most of the students exhibited poor dietary behaviour. For example, 65% of Health Science students and 67% of students in other faculties consumed less than one fruit per day, 70% of Health Science students and 64% of other students consumed less than one vegetable per day, while 91% of Health Science students and 93% of students in other faculties consumed less than two glasses of milk per day. Although not significant, fewer Health Science students (4%) than students of other faculties (9%) consumed alcohol more than twice a week. Binge drinking was more common in Health Science students. Forty-eight per cent of the Health Science students indicated that they were physically inactive, compared to 49% of students in other faculties.

**Conclusion:** Students studying Health Science do not have a healthier lifestyle than other students. Further theory-based intervention studies to determine the reasons for this behaviour need to be undertaken. Strategies should be developed to encourage behavioural change.

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S Afr J Clin Nutr 2015;28(4):154-159

## Introduction

Universities are responsible for holistic education. Therefore, they should offer educational intervention strategies to prevent risky behaviour.<sup>1</sup> The course content of Health Sciences programmes specifically includes education to promote a healthy lifestyle.<sup>2,3</sup> Therefore, students who have chosen to become health professionals should have more knowledge of a healthy lifestyle than other students, but it is unclear whether or not these students are more motivated to apply this knowledge, and adopt healthier lifestyle practices, than other students.

Many international studies have reported on an inadequate intake of important food groups by university students, especially dairy

products, and fruit and vegetables.<sup>4-6</sup> Only a few South African studies have been conducted on the dietary patterns of Health Science students, and these support international trends, such as inadequate fruit and vegetable intake and inactivity.<sup>5,7</sup> Healthier eating and activity patterns in Health Science students were reported in one study, although 83% of the sample was found to have an insufficient dairy intake.<sup>8</sup> The dietary intake of Health Science students was not compared with that of other university students in any of these studies.

Only some factors that influence the weight status of students will be addressed in this study.<sup>9</sup> The consumption of "junk" food can contribute to an individual's total energy intake and weight gain.<sup>10</sup> It

was reported in one South African study that 93% of Health Science students consumed sweet snacks weekly, but only 20% of this dominantly white group of students were overweight or obese.<sup>8</sup> In comparison, another predominantly black group of South African Health Science students presented with overweight and obesity (43% for the women, and 17% for the men, respectively).<sup>7</sup> Peltzer et al reported the prevalence of overweight and obesity in South African students from all study fields at two universities to be 17% in the men and 41% in the women, i.e. a 24% difference.<sup>6</sup> An overall prevalence of 22% of overweight and obesity in international university students in 22 low-, middle-income and emerging economy countries was reported in the same study. There was a higher prevalence of overweight and obesity in the men than in the women, i.e. a 5% difference.<sup>6</sup>

It was reported following international research that most students do not eat three regular meals a day, and that the percentage of students consuming breakfast (the most important meal of the day) regularly is also low.<sup>4,11</sup> Ninety-three per cent of Health Science students indicated that they ate breakfast on a daily basis in one South African study in which skipping breakfast was investigated.<sup>8</sup>

The excessive intake of alcohol may affect a student's general physical and mental well-being and lower academic performance.<sup>5,12</sup> These detrimental effects can impact on academic success. El-Ansari et al reported a binge drinking prevalence of 65% in women, and 76% in men, in seven universities in the UK.<sup>4</sup> Reports on binge drinking specifically were not published in various South African studies, but Pengpid and Pelzer reported on harmful or dangerous alcohol consumption by 22% of South African students.<sup>7</sup> It was reported that 30% of the female and 71% of the male students from all study fields at three South African university campuses consumed alcohol three times or more per week.<sup>5</sup> Van den Berg et al reported that 95% of Health Science students drank alcohol only once a week, with the median intake on such days being three units per person.<sup>8</sup>

Participation in health-enhancing physical activity, defined by the Youth Risk Behaviour Surveillance System Questionnaire as activity for more than 20 minutes at a time, at least three times a week,<sup>13</sup> leads to improved cardiovascular and metabolic fitness and enhanced bone health.<sup>14</sup> Physical activity is low (less than the recommended 20 minutes at least three times per week) and on the decrease in South African students, even in Health Science students.<sup>7,15</sup> Thirty-three per cent of students from all study fields engaged in low physical activity, and only 19% in high physical activity, in a South African study. The criteria used (International Physical Activity Questionnaire) for high physical activity were either vigorous-intensity activity at least three days a week, resulting in a minimum of at least 1 500 metabolic equivalent (MET) minutes/week, or else any combination of walking, moderate-intensity or vigorous-intensity activities resulting in a minimum of at least 3 000 MET minutes/week, for seven days.<sup>16</sup> However, in research that specifically focused on South African Health Science students, only 2% of them were inactive, and 59% indicated a high level of physical activity, using physical activity level values as the standard.<sup>8</sup>

Comparisons of risky health behaviour in Health Science students with that of other university students are limited in the literature. Kazi and Coopoo compared the weight, physical activity and smoking habits of Sport Science students with other university students, and found that more male Sport Science students were overweight and obese (36%) than other male students (18%), but less female Sport Science students were overweight and obese (27%) than other female students (35%).<sup>9</sup> The authors of the article acknowledged that although body mass index (BMI) is a generally accepted method of classifying overweight and obesity, it does not differentiate between muscle and body fat. However, BMI was still used for the classification of students who were overweight and obese, and also for Sport Science students, in that study. Sport Science students were significantly more active than other students, but the physical activity levels for most of the students did not meet the minimum guidelines of vigorous exercise three times a week, or moderate physical activity five times a week, as recommended by the American College of Sports Medicine.<sup>9</sup>

The present research was undertaken to investigate risky health behaviour by students in order to identify priority areas for health intervention, and future research in higher education institutions. It was hypothesised that the health behaviour of Health Science students would be less risky than that of other students as they should be able to apply the knowledge gained in their field of study.

## Method

A cross-sectional online survey was implemented between May and June 2013 to determine the risky health behaviour of students at a South African university, and to compare the behaviour of Health Science students with that of other university students.

Registered students aged  $\geq 18$  years, with access to the university's student portals in 2013, were invited to voluntarily participate in the study. Those who provided informed consent were included therein. Six hundred and nineteen students completed the questionnaire within the five weeks that the questionnaire was online. The mean age of the sample was 24.2 years (standard deviation of 4.2). Twenty-seven per cent ( $n = 796$ ) of the total sample were male students, and 25% ( $n = 31$ ) of the students in the Faculty of Health Sciences were male. Similar numbers from every year participated, with 23-26% of the sample in the first, second and third years, and the remainder in the fourth year or postgraduate programme (Table 1).

Approval for the research was obtained from the university's research ethics committee, and the students were assured of anonymity.

The survey questionnaire was based on the Youth Risk Behaviour Surveillance System,<sup>13</sup> tested for reliability and validity in previous studies.<sup>17</sup> The present researchers used a similar approach, with the assumption that dietary and alcohol intake and physical activity could be influential factors in a range of risky health behaviour by young adults. The authors did not report on other lifestyle issues, such as smoking and sexual behaviour patterns in this article, which may also have been the cause and/or effect of other risky health behaviour by young adults.<sup>13</sup>

**Table 1:** The demographic composition of Health Science students compared to that of the other students

Demographic characteristics	NNMU in total (n = 26 408)	Faculty of Health Sciences (n = 2 977)
	n (%)	n (%)
<b>Students at NNMU in total</b>		
Male	12 212 (46.24)	796 (24.76)
Female	14 196 (53.76)	2 181 (73.26)
<b>Students who participated in the study</b>		
Male	210 (26.74)	31 (24.60)
Female	409 (66.07)	95 (75.40)
<b>Year of study</b>		
<b>Students at NNMU in total</b>		
First	8 230 (31.16)	
Second	5 935 (22.47)	
Third	7 170 (27.15)	
Fourth	3 183 (12.05)	
Higher than fourth	1 667 (6.31)	
<b>Students at NNMU who participated in the study</b>		
First	138 (22.55)	24 (19.05)
Second	162 (26.47)	36 (28.57)
Third	162 (26.47)	35 (27.78)
Fourth	70 (11.44)	13 (10.32)
Higher than fourth	80 (13.08)	18 (14.29)
<b>Race</b>		
<b>Students at NNMU in total</b>		
Indian	467 (1.77)	59 (1.98)
Black	15 972 (60.48)	1 749 (58.75)
White	6 243 (23.64)	633 (21.26)
Coloured	3 726 (14.11)	536 (18.00)
Other		
<b>Students at NNMU who participated in the study</b>		
Indian	14 (2.27)	
Black	413 (66.72)	
White	8 (1.29)	
Coloured	69 (11.5)	
Other	115 (18.58)	

\* Students who did not want to specify their race  
NNMU: Nelson Mandela Metropolitan University

The questionnaire was tested during a pilot study on 20 Health Science students, and adapted to make minor language and other changes relevant to the South African context and the present research.

Dietary patterns were described according to the frequency of dairy, fruit and vegetable intake, the regularity of breakfast consumption, and buying fast foods and unhealthy snacks  $\geq 3$  times/week, for the purposes of this study. Alcohol consumption was described as frequency of consumption (number of times per week), binge drinking and the frequency of passing out after binge drinking. In

this study, binge drinking refers to the consumption of  $\geq 4$  and  $\geq 5$  drinks in two hours, by women and men, respectively.

Risky health behaviour with regard to physical activity was defined according to the Youth Risk Behaviour Surveillance System questionnaire cut-off points. Physical inactivity was classified in the present research to be the absence of regular walking for more than 20 minutes at a time, at least three times a week. As the questionnaire used to gather the data was quite lengthy, the section on physical activity was not expanded to include specific types of exercise. All exercise more strenuous than walking, including cycling, running and swimming, for more than 20 minutes at a time, was classified as exceeding the minimum requirements previously described. Excess frequency and duration of watching television was included as an indication of an inactive lifestyle.<sup>13</sup>

### Statistical analysis

The data were analysed using SPSS® version 21. Descriptive statistics (frequencies and percentages) were used, and subgroup comparisons between the Health Science students and other students were made using Pearson's chi-square test (p-value  $< 0.050$ ) to describe the categorical data outcome.

### Results

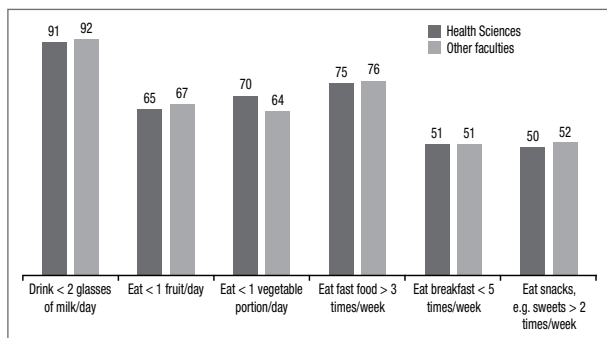
The demographic data were used to determine whether or not the sample was representative of the current student population (Table 1).

There were 2 977 students (11% of all the registered students) studying Health Sciences at the university. One hundred and twenty-six of the Health Science students (20% of the study sample) participated in the present study.

Although the sample (n = 619) was similar to the population group in terms of age, gender and year of study, it was unlikely to be representative of race as 19% (n = 115) of the sample refrained from choosing one of the pre-selected options, and only 1% (n = 8) indicated that they were white. Thus, the results cannot be generalised for this subject variable.

The most comprehensive section of the study covered the eating habits of the students. Some of the eating habits of the students are illustrated in Figure 1.

A statistical difference was not noted between the eating habits of Health Science students and the eating habits of students in other disciplines. Ninety-two per cent of the participants (n = 564) indicated that they drank less than two glasses of milk a day. According to the South African dietary guidelines,<sup>18</sup> the consumption of fruit in this study was inadequate as 67% (n = 412) of the total sample, and 65% (n = 82) of the Health Science sample, compared to 67% (n = 330) of students in other faculties, ate less than one portion of fruit per day. The same trend was evident for vegetables, with 70% (n = 88) of the Health Science students, and 64% (n = 313) of the other students, eating less than one vegetable portion a day. When comparing women and men, the only significant difference was that more male Health Science students (84%) consumed less



**Figure 1:** A comparison of the eating habits of Health Science students and those of the other students (expressed as a percentage)

than one vegetable per day than male students in the other faculties (66%), ( $p$ -value 0.045).

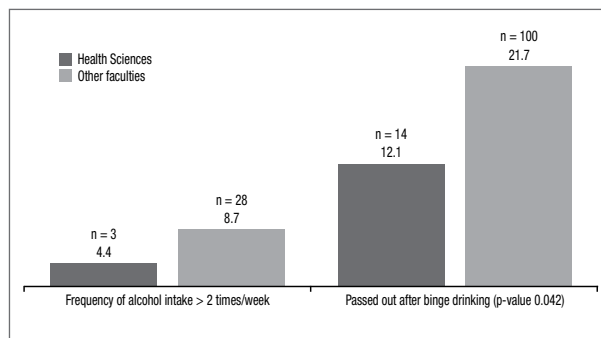
There was no significant difference with respect to breakfast consumption between the Health Science students and the breakfast consumption of the other students. Fifty-one per cent of Health Science students ( $n = 64$ ) consumed breakfast less than five times a week, compared to 51% ( $n = 250$ ) of other students. Twenty-five per cent of the total sample of students ( $n = 154$ ) indicated that they consumed less than three meals a day.

Of all the students in the sample, the majority (71% of the male and 78% of the female students), ( $n = 452$ ) often (i.e. more than three times per week) bought convenience food, such as takeaways. There was no significant difference between the Health Science students who bought convenience food more than three times a week (75%,  $n = 92$ ) and students in the other faculties (76%,  $n = 360$ ). Although the difference was not significant, female Health Science students consumed less sweet snacks (50%,  $n = 47$ ) than female students in the other faculties (39%,  $n = 123$ ) ( $p$ -value 0.078). Male Health Science students also consumed less sweet snacks (52%,  $n = 16$ ) than male students in the other faculties (64%,  $n = 112$ ), ( $p$ -value 0.20). Female students consumed significantly more sugar-containing snacks regularly ( $\geq 3$  times/per week) than the male students ( $p$ -value < 1.000). There was also no significant difference between the consumption of sugar-containing snacks by students in different years of study, in either Health Sciences or the other faculties.

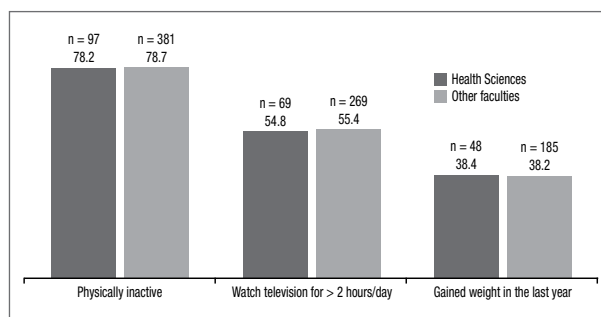
Significantly fewer Health Science students (7%,  $n = 9$ ) consumed energy drinks containing stimulants, such as Red Bull Energy Drink™ or Monster Energy™, than students in the other faculties (14%,  $n = 67$ ), ( $p$ -value 0.045).

The alcohol consumption pattern of Health Science students, in comparison with that of students in the other faculties, is indicated in Figure 2.

A statistical difference was not found between the frequency of alcohol consumption by Health Science students and the frequency of alcohol consumption by the other students. The majority of the total sample (83%,  $n = 514$ ) reported that they did use alcohol, and 64% ( $n = 398$ ) indicated that they used alcohol before they started at university. Only 2% ( $n = 3$ ) of Health Science students and 6%



**Figure 2:** The alcohol consumption pattern of Health Science students, in comparison with that of students in the other faculties (expressed as a percentage)



**Figure 3:** The physical activity pattern of Health Science students, in comparison to that of students in the other faculties (expressed as a percentage)

( $n = 28$ ) of other students used alcohol more than twice a week – the amount of times which students who participated in the pilot study regarded as the norm for Nelson Mandela Metropolitan University students going out during the semester. Fifty-two per cent of Health Science students ( $n = 66$ ) and 60% ( $n = 294$ ) of the other students used alcohol less than twice a month. Twelve per cent of Health Science students ( $n = 14$ ) had passed out after binge drinking, significantly less than the other students (22%,  $n = 100$ ), ( $p$ -value 0.042). Forty per cent of the total sample of male students ( $n = 83$ ), and 28% of the female students ( $n = 116$ ) had experienced at least one episode of binge drinking in the last year. Students were not asked to report on the total number of binge drinking episodes in which they had been involved over the last year.

The physical activity pattern of Health Science students, in comparison to that of students in the other faculties, is illustrated in Figure 3.

A significant difference was not found between the physical activity patterns of Health Science students and the physical activity patterns of the other students. Seventy-eight per cent of the students in the Health Science group ( $n = 97$ ) were physically inactive, i.e. below the cut-off point of walking briskly  $\geq 3$  times/week, compared to 79% ( $n = 381$ ) of students in the other faculties. Fifty-five per cent ( $n = 69$ ) of Health Science students and 55% ( $n = 269$ ) of students in the other faculties watched television  $\geq 4$  times/week, indicative of a sedentary lifestyle. Twenty-eight per cent of the Health Science sample ( $n = 35$ ) compared to 29% ( $n = 142$ ) of students in the other

sample, watched television  $\geq 2$  hours/day. A significant difference was not reported between the various years of study.

Self-reported weight fluctuations indicated that significantly more female students (45%,  $n = 183$ ) than male students (25%,  $n = 51$ ) ( $p$ -value  $< 0.000$ ) gained weight during the specific year of study. However, a significant difference between Health Science students and those in the other faculties was not reported. Neither was a significant difference between students from the different study years reported.

## Discussion

Only a few significant differences were found between Health Science students and other university students for factors regarded as risky health behaviour and explored in this study. In particular, more Health Science male students consumed less than one vegetable per day, fewer Health Science students reported passing out after binge drinking, and fewer Health Science students drank energy drinks with stimulants often.

Health Science students did not have better eating habits. The low consumption of the important food groups, such as milk, vegetables and fruit, by all of the students was particularly concerning, especially as Health Science students should have more comprehensive knowledge of this topic. The findings are in accordance with those of other researchers who have investigated the health knowledge of Health Science students,<sup>5,7,19</sup> except for the study by Van den Berg et al, in which Health Science students' consumption of fruit and vegetables was found to be relatively good.<sup>8</sup> A low intake of fruit and vegetables may lead to a low dietary fibre and vitamin intake, while a higher intake of energy-dense foods can lead to weight gain.<sup>20</sup> The low consumption of dairy products by female students is especially concerning because of implications with regard to the risk of osteoporosis later in life.<sup>20</sup>

Compared to 93% of the Health Science students who reported regular breakfast consumption in the study by Van den Berg et al,<sup>8</sup> breakfast consumption in this study was less regular in Health Science students (51%) and in all of the other students (51%). This can result in a low attention span, and irritability and tiredness due to low blood sugar levels.<sup>20</sup> Not eating a regular, nutritious breakfast is particularly troublesome as Health Science students may be involved in practical work, in places such as hospitals, where a low attention span and fatigue can cause mistakes and increased feelings of demotivation.<sup>20</sup>

The high intake of convenience foods by all of the students, and especially the high intake of sweet snacks by female students, indicates that many of them adopted a low-fibre diet because the types of convenience food on campus were mostly chicken and white bread. Sweets consumed the most were hard boiled and chocolate types. The present study results are reflective of similar trends reported in other studies.<sup>4,19</sup> The lack of a significant difference between fast food and sweet consumption by students in Health Sciences and that by other university students suggests that

Health Science students did not always understand the implications of their decisions, or did not have insight as to how to apply their knowledge, especially as a significant difference between the years of study was also not reported.

Although only 2% of Health Science students, and 6% of the other students, consumed alcohol more than twice a week, a large number of students in both groups experienced episodes of binge drinking, and even passing out thereafter. This is worrying, especially as such behaviour can lead to other risky behaviour, such as unprotected sexual intercourse with strangers.<sup>21</sup>

Kazi and Coopoo found a 5% higher prevalence of overweight and obesity in male versus female students at another South African university.<sup>9</sup> By comparison, the results of the present study indicated that female students gained significantly more weight during the specific year of study. Such a finding is supported in other South African studies in which female students have been reported to be more prone to overweight and obesity than male students.<sup>7,8</sup> The researchers in this study did not weigh the participants (participants only reported on their weight gain or loss). Thus, conclusions about weight differences between the male and female students cannot be made. However weight gain, in combination with other risky health behaviour, such as a sedentary lifestyle and poor dietary choices, may contribute to overweight and obesity, and even noncommunicable diseases, such as coronary heart disease and diabetes mellitus in later years.<sup>9</sup> Therefore, it is problematic that such a high percentage of students, and especially students in Health Sciences, reported a sedentary lifestyle. Only a few indicated that they participated in strenuous exercise.

The lack of physical activity at this university seemed to be less than that reported by students in the UK.<sup>4</sup> It was also less than that reported by Health Science students at the University of the Free State, where 59% of the students indicated that they took part in strenuous exercise.<sup>8</sup> A sample of students in the third year of study from all of the faculties at the university just mentioned also reported being more active. High activity levels were reported by 34% of the students.<sup>16</sup> However, different ways of measuring physical activity were used, and this complicates the interpretation of the results.

## Conclusion and recommendations

This study increased existing knowledge of the health behaviour of students at a particular South African university, especially regarding the absence of sound health practices by Health Science students.

There was no significant difference between Health Science students and those in other faculties in terms of the percentage of students who participated in the study. There was also no significant difference between the food intake behaviour of the students in Health Sciences and the other faculties in the various years of study. Theory-based intervention research should be undertaken to provide a clearer understanding of how and why university students make healthy or unhealthy lifestyle choices, and what programmes, as well as what changes to programmes, would be most suitable to

change the behaviour of Health Science students. As universities are responsible for holistic education, intra- as well as extra-curricular interventions should also be considered. Until such research is performed and changes are introduced, awareness and motivational campaigns which are not solely based on building knowledge should be undertaken in order to make students more aware of the possible consequences of their behaviour. These campaigns should promote healthier food choices, and explain the practical implication of poor food choices to students throughout the university. Peer pressure plays an important role in risky health behaviour with respect to alcohol intake. Motivational campaigns should be introduced to strengthen the message that students are not less popular if they choose not to consume excessive quantities of alcohol. More research on the impact of various factors, such as the availability of food, financial constraints and culture, is also necessary.

Although the authors intend to introduce awareness campaigns at this university, and continue with theory-based intervention research, there is a critical need for earlier modification by targeting schoolchildren with the use of awareness campaigns which may be of more value.<sup>22</sup> The need for continuous longitudinal monitoring of risky health behaviour by students, and of their well-being at this university, was also confirmed by the study.

As mentioned previously, the present sample was not representative of all race groups. Thus, the findings cannot be generalised to the total population of the university. Although convenience sampling increased participation in the study, this sampling technique did not conform to the statistical principle of randomness. Therefore, information gained from this form of sampling cannot be generalised to other settings or populations.<sup>23</sup>

The assessment of physical activity levels were limited in this study as a standardised physical activity questionnaire was not used, and this also means that direct comparisons cannot be made with other studies.

### Conflict of interest

The authors declare that they have no financial or personal relationships which may have inappropriately influenced them when writing this article.

### Acknowledgements

Ingrid Oxley Oxland is thanked for providing technical support during data collection and analysis.

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