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# Comparative study of health behavior among college students at the start and end of their courses

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## ABSTRACT

**OBJECTIVE:** To analyze differences in health behavior among students studying health related subjects in public universities, between the beginning and end of their courses.

**METHODS:** The study sample comprised 735 students in health sciences at the public universities in Pernambuco state (Northeastern Brazil) in 2006. The data were collected by means of the National College Health Risk Behavior Survey that had been validated previously for use among university students. Descriptive and inferential statistical techniques were used. The chi-square test or Fisher's exact test was used to analyze associations. Results were considered to be significant for  $p \leq 0.05$ .

**RESULTS:** The majority (69.5%) of students were female. Fewer students were found to be living with their parents or a guardian by the end of the course. However there were no significant differences for violent behavior, related to weight and physical activity, nor for most behavior relating to traffic safety and food intake. The consumption of alcohol (68.8% vs. 83.3%), tobacco (40.7% vs. 52.5%) and inhalants (10.2% vs. 21.9%) and sexual practices (62.5% vs. 85.0%) were more frequent by the end of the course, with statistically significant differences.

**CONCLUSIONS:** In general, health behaviors did not differ significantly between students at the beginning and end of graduate courses in health sciences.

**DESCRIPTORS:** Students, Health Occupations. Life Style. Health Behavior. Health Knowledge, Attitudes, Practice. Questionnaires.

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## INTRODUCTION

Health behaviors that are formed during childhood and adolescence can have a significant impact on the occurrence of future illnesses.<sup>1,2</sup> Young people tend to adopt health behaviors that are not very healthy. Between 1990 and 2000, studies have reported on changes in the health behavior of young European university students showing a trend towards a less healthy lifestyle.<sup>1,11</sup>

Many studies from around the world have treated different health behaviors, such as: transport safety, violence, smoking, the use of alcohol and illegal drugs, sexual behavior, eating, weight control and the practice of physical exercise.<sup>1,2,4,9,11</sup>

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Received: 1/8/2007

Reviewed: 11/10/2007

Approved: 1/3/2008

Alcohol is the most commonly consumed drug among young people, representing an important risk factor for the adoption of other behaviors that represent a health risk. In a study of American students, there was found to be a relationship between the consumption of alcohol to the point of inebriation and the consumption of cigarettes, marijuana, cocaine and other drugs.<sup>7</sup> Douglas et al<sup>4</sup> found that American university students were involved in many risks to their health, confirming the importance of monitoring such behaviors, including: the consumption of marijuana (14.0%), consumption of cocaine (14.4%), and the high percentage of sexual activity (86.1%).

Also in the United States a relationship was found between risky behaviors among university students (car accidents, consumption of alcoholic beverages and violence) and suicidal thoughts.<sup>3</sup> According to this study, those students that thought about suicide were more likely to carry weapons and become involved in fights, to drive after consuming alcohol as well as take a ride with a driver who had been drinking, and rarely or never use a seatbelt.

With regard to smoking among young people, the average age to start smoking was during adolescence, between 16 and 17 years of age, in the USA.<sup>10</sup> Everett et al<sup>5</sup> reported that when American university students tried to stop smoking, only one in four was successful.

In Turkey, risk behaviors amongst university students in the capita Ankara were in most cases related to low socioeconomic conditions, with the exception of alcohol use which was related to wealthier groups.<sup>9</sup>

Among the studies dealing with risk behavior in Brazil, Fiates & Salles<sup>6</sup> reported a greater susceptibility to eating disorders amongst students, particularly those studying nutrition, in spite of the knowledge acquired during their studies. In the state of Paraná (Southern Brazil), risk behaviors in cards were most common amongst medical students (N=309), who reported driving after drinking alcohol (35.8%), being involved in accidents (62.7%) and not using a seatbelt on the back seat (90%).<sup>1</sup> In the state of Amazonas (Northern Brazil), almost a third of university students (30.7%) already smoked, while the majority (69.6%) reported that tobacco "seriously damages your health".<sup>8</sup>

In light of these studies that show unhealthy behaviors amongst young students, the need to encourage students of health sciences to adopt healthier practices is all the more compelling. They will be responsible for providing advice and orientation to patients with strategies for preventing illnesses.

Nonetheless, few studies have focused on the health behaviors of future health professionals. The objective of the present study was to analyze the differences in health behaviors among students of health sciences at public university, between the beginning and end of their courses.

## METHODS

The target population was made up of university students who were studying the 13 courses in health sciences at the two public universities in the state of Pernambuco (Northeastern Brazil) and who were formally registered at both the beginning and end of their course. The sample calculation was stratified by course and university, with a total sample size of 439 individuals (229 at the start and 210 at the end of their course). In order to determine the sample size in each period under analysis, the following issues were taken into consideration: the objective of determining the percentages (prevalences) of the risk factors; prevalences obtained in the research sample closest to 50%; margin of error of 5%; confidence that the margin of error was not passed; the number of students in each period at the two universities. The final sample was made up of 735 students; 352 at the start and 383 at the end of their courses.

Students were deemed to be at the start of their course if they had registered for the first semester and at the end if registered for the final semester and studying theory. This criterion was adopted so that all students could answer the questionnaire in class.

Data was collected in the lecture rooms, on the course with the largest number of registered students, by means of an individual anonymous self-administered questionnaire. Data collection took place between April and August 2006.

The instrument used for data collection was the National College Health Risk Behavior Survey (NCHRB), a questionnaire about health behavior that was developed by the Center for Disease Control and Prevention (CDC)<sup>13</sup> in the USA. The questionnaire gathers socio-demographic information and covers the following health related themes: traffic safety, violence related behavior, consumption of legal (alcohol and tobacco) and illegal drugs, sexual behavior, eating habits, weight perceptions and the practice of physical exercise.

To analyze the data, descriptive and inferential statistics techniques were used. Initially an exploratory univariate analysis was used to measure the distribution of frequencies of variables under study. To analyze the association between variable, the Chi-square or Fisher Exact test were used. The results were considered statistically significant for a value of  $p < 0.05$ .

The data were entered into an electronic spreadsheet and the statistical calculations were done using SPSS version 13.0.

The research project was approved by the Ethics Committee at the Universidade de Pernambuco (protocol number 087/04). All participants signed terms of informed consent, and their anonymity was guaranteed.

## RESULTS

Out of a total of 1,083 eligible students, 735 participated, of which 480 were from one university and 255 from the other one. Distribution by gender showed that approximately two thirds (69.5%) of participants were women. The majority (76.7%) reported that they lived

with their parents or a guardian, with a reduction of 7.5% ( $p < 0,001$ ) between the start and the end of a course.

There were no significant differences in the levels of violent behavior between the start and the end of the course. For most indicators relating to transport safety there were no significant differences between the two

**Table 1.** Behaviors by university students in relation to violence and traffic safety by period of study. Pernambuco, Northeastern Brazil, 2006.

Behavior	Semester				p
	First		Last		
	N	%	N	%	
Carry a firearm or knife in the previous month*	350	100.0	383	100.0	
Never	344	98.3	375	97.9	0.596**
Rarely/ occasionally	2	0.6	5	1.3	
Most days/ always	4	1.1	3	0.8	
Be involved in a fight during the last year	352	100.0	383	100.0	
Never	334	94.9	363	94.8	0.580**
Rarely/ occasionally	18	5.1	18	4.7	
Most months/ every month	-		2	0.5	
Think about suicide during the last year****	352	100.0	382	100.0	
Yes	14	4.0	16	4.2	0.885***
No	338	96.0	366	95.8	
Attempt suicide in the last year****	351	100.0	383	100.0	
Yes	4	1.1	4	1.1	1.000**
No	347	98.9	379	98.9	
Use a seatbelt in the front seat of a vehicle	352	100.0	383	100.0	
Never	2	0.6	-	-	0.007**
Rarely/ occasionally	8	2.3	1	0.3	
Most times/ always	342	97.1	382	99.7	
Use a seatbelt in the back seat of a vehicle	352	100.0	383	100.0	
Never	51	14.5	39	10.2	0.148***
Rarely/ occasionally	230	65.3	272	71.0	
Most times/ always	71	20.2	72	18.8	
Use a helmet when traveling by motorbike****	351	100.0	383	100.0	
Do not travel by motorbike	198	56.4	249	65.0	
Never	8	2.3	6	1.6	0.093***
Rarely/ occasionally	18	5.1	12	3.1	
Most times/ always	127	36.2	116	30.3	
Use a helmet when traveling by bicycle****	351	100.0	383	100.0	
Do not travel by bicycle	177	50.4	221	57.7	
Never	157	44.7	145	37.9	0.215***
Rarely/ occasionally	12	3.4	10	2.6	
Most times/ always	5	1.4	7	1.8	
Drive after alcohol consumption or take a lift from someone who has consumed alcohol****	352	100.0	382	100.0	
Never	179	50.8	133	34.8	<0.001***
Rarely/ occasionally	128	36.4	174	45.6	
Most times/ always	45	12.8	75	19.6	

\* Fisher exact test

\*\* Information not available for two respondents

\*\*\* Pearson's chi-square

\*\*\*\* Information not available for one respondent

**Table 2.** Behavior of university students in relation to the consumption of tobacco, alcohol, marijuana and other illicit drugs by period of study. Pernambuco, Northeastern Brazil, 2006.

Behavior	Semester				p
	First		Last		
	N	%	N	%	
<b>Tobacco</b>					
Ever used**	351	100.0	383	100.0	
Yes	143	40.7	201	52.5	0.001*
No	208	59.3	182	47.5	
Use regularly**	351	100.0	383	100.0	
Yes	25	7.1	42	11.0	0.071*
No	326	92.9	341	89.0	
Attempting to give up smoking***	40	100.0	52	100.0	
Yes	16	40.0	22	42.3	0.824*
No	24	60.0	30	57.7	
<b>Alcohol</b>					
Ever used	352	100.0	383	100.0	
Yes	242	68.8	319	83.3	<0.001*
No	110	31.3	64	16.7	
Used this month**	352	100.0	382	100.0	
Yes	184	52.3	258	67.5	<0.001*
No	168	47.7	124	32.5	
<b>Marijuana</b>					
Ever used	352	100.0	383	100.0	
Yes	26	7.4	63	16.4	<0.001*
No	326	92.6	320	83.6	
Used this month	352	100.0	383	100.0	
Yes	3	0.9	15	3.9	0.007*
No	349	99.1	368	96.1	
<b>Illicit drugs (ever used)</b>					
Cocaine	352	100.0	383	100.0	
Yes	2	0.6	6	1.6	0.290****
No	350	99.4	377	98.4	
Solvents	352	100.0	383	100.0	
Yes	36	10.2	84	21.9	<0.001*
No	316	89.8	299	78.1	
Steroids (in pill form or injected)*****	351	100.0	381	100.0	
Yes	22	6.3	27	7.1	0.658*
No	329	93.7	354	92.9	
LSD (lysergic acid diethylamide), PCP (phencyclidine), ecstasy, heroin, amphetamine	352	100.0	383	100.0	
Yes	3	0.9	13	3.4	0.018*
No	349	99.1	370	96.6	

\* Pearson's chi-square

\*\* Information not available for one respondent

\*\*\* Among students who smoke regularly; information not available for 24 respondents.

\*\*\*\* Fisher exact test

\*\*\*\*\* Information not available for three respondents

groups, with the exception of the use of the seatbelt when sitting in the front seat of a car, which was more common amongst students at the end of their courses. However, the consumption of alcohol by drivers

showed a significant increase for students at the end of their courses (Table 1).

Table 2 shows that tobacco and alcohol consumption was high among students, particularly those ending

their courses. There was a significant difference in terms of tobacco use, which was greater amongst final year students. The number of students who consumed marijuana more than doubled between the first and last semester, a significant difference, while the consumption of other illicit drugs was also higher amongst students ending their courses.

With regard to sexual behavior, most behaviors were significantly different between the two groups of students (see Table 3).

Most behaviors related to eating were not significantly different between the two groups, although the consumption of savory snacks was significantly greater amongst students at the end of their courses (Table 4). In this table, it is also possible to observe a significant difference in levels of physical activity between the two groups, with final year students practicing more regularly such an activity.

## DISCUSSION

Differences in health behaviors between students at the start and those at the end of their courses were generally not significant. However, a greater percentage of those ending their studies were found to carry out harmful practices, such as smoking and alcohol consumption.

It would be expected that healthy behaviors favorable to health promotion are more prevalent at the end of a course in health sciences. Nonetheless some harmful habits proved to be more common amongst those students in their final year. Other studies are necessary in order to consider related factors and the reasons behind related health behaviors.

These results are consistent with those presented by Steptoe et al,<sup>11</sup> who found that European university students did not adopt more healthy lifestyles between 1990 and 2000.

The percentage of students reporting violent behaviors was generally low and there were no significant differences between the two groups. Suicide attempts were reported by a small percentage of students in both groups (1.1%), and this was consistent with the results reported by Barrios et al,<sup>3</sup> (1.7%) among American students.

With regard to transport safety, seatbelt use in the front seat of cars was significantly more frequent among students at the end of their courses. However, seatbelt use in the back seats of cars was very low among both groups, with no statistically significant difference. It may be that the habit of using a seatbelt is more related to the fear or risk of punishment, by means of a fine, than educative measures such as awareness of the need to take care of one's body.

**Table 3.** Sexual behavior for university students by period of course. Pernambuco, Northeastern Brazil, 2006.

Behavior	Semester				p*
	First		Last		
	N	%	N	%	
Ever experienced**	349	100.0	379	100.0	
Yes	218	62.5	322	85.0	<0.001
No	131	37.5	57	15.0	
Sexual activity in the previous month***	348	100.0	378	100.0	
Never	212	60.9	109	28.8	<0.001
Rarely/ occasionally	107	30.8	198	52.4	
Most days/ every day	29	8.3	71	18.8	
Condom use in the previous month****	150	100.0	275	100.0	
Never	18	12.0	53	19.3	<0.001
Rarely/ occasionally	36	24.0	103	37.4	
Most times/ always	96	64.0	119	43.3	
Alcohol or drug use prior to sexual relations*****	216	100.0	321	100.0	
Yes	34	15.7	66	20.6	0.159
No	182	84.3	255	79.4	

\* Pearson's chi-square

\*\* Information not available for seven respondents

\*\*\* Information not available for nine respondents

\*\*\*\* Percentage calculated for those participants who had already had a sexual experience; information not available for 15 respondents.

\*\*\*\*\* Percentage calculated for those participants who had already had a sexual experience; information not available for 12 respondents.

**Table 4.** Behavior related to weight, eating and physical activity amongst university students by period of course. Pernambuco, Northeastern Brazil, 2006.

Behavior	Semester				p*
	First		Last		
	N	%	N	%	
Perception of weight					
Dieting to lose or maintain weight	352	100.0	383	100.0	
Yes	92	26.1	119	31.1	0.140
No	260	73.9	264	68.9	
Exercising to lose or maintain weight	352	100.0	383	100.0	
Yes	105	29.8	154	40.2	0.003
No	247	70.2	229	59.8	
Vomiting or taking a laxative to lose or maintain weight	352	100.0	383	100.0	
Yes	11	3.1	9	2.3	0.519
No	341	96.9	374	97.7	
Eating**					
Consumption of fruits or fruit juices	351	100.0	383	100.0	
Yes	268	76.4	290	75.7	0.840
No	83	23.6	93	24.3	
Consumption of vegetables and greens	352	100.0	383	100.0	
Yes	161	45.7	195	50.9	0.161
No	191	54.3	188	49.1	
Consumption of savory snacks	352	100.0	383	100.0	
Yes	198	56.2	181	47.3	0.015
No	154	43.8	202	52.7	
Consumption of sweet snacks	352	100.0	383	100.0	
Yes	293	83.2	299	78.1	0.077
No	59	16.8	84	21.9	
Physical activity					
Practiced physical activity in the previous week	352	100.0	383	100.0	
Yes	123	34.9	164	42.8	0.029
No	229	65.1	219	57.2	

\* Pearson's chi-square

\*\* On the previous day. Information not available for one respondent.

On the other hand, in spite of the legal prohibition on driving after alcohol consumption, the percentage of students who did so was greater at the end of the course. A similar result was found by Andrade et al<sup>1</sup> for male medical students from the state of Paraná. The high percentage of this risk behavior among Brazilian students helps to explain the high percentage of fatal accidents reported by the National Department for Transport,<sup>a</sup> both in Brazil (26.5%) and in the state of Pernambuco (27.8%) for the population of student age. This makes it all the more necessary to take action on the behavior of young drivers in order to protect both them and the general public who use public roads.

There was a difference of 11.8% in tobacco use between students at the beginning and those at the end of their

course, pointing to a need for preventive interventions at the beginning of the course. The percentage of students who had tried cigarettes at least once in their lives was more than half of final year students. A similar result (54.7%) was found by Von Ah et al<sup>12</sup> among American students.

Regular tobacco use was also greater amongst final year students (11%) compared with those in their first year (7.1%). This result is cause for concern since Pierce & Gilpin<sup>10</sup> report that this vice is likely to last 16 years amongst men and 20 among women. The authors advise that prevention should focus on discouraging experimenting since once the habit has begun, the vice is expected to be long lasting.

<sup>a</sup> Ministério das Cidades. Departamento Nacional de Trânsito - DENATRAN. Anuário estatístico de acidentes de trânsito - 2002 [acesso em 7 jul 2006]. Disponível em: <http://www.denatran.gov.br/acidentes.htm>

Results measuring attempts to stop smoking were very similar between the two groups, with this being the case for 40% of students in their first semester and for 42.3% of those in their final semester, in spite of the fact that the percentage of regular smokers was significantly greater amongst students in the final year of their course. While many students tried cigarettes and thus ran a high risk of becoming smokers, few managed to give up the addiction,<sup>5</sup> supporting Pierce & Gilpin's<sup>10</sup> argument that prevention should focus on first trying tobacco.

A high percentage of students reported that they consumed alcohol, a similar finding to that of Lucas et al<sup>8</sup> regarding students from Amazonas. This is probably to do with the fact that alcohol is a legal and socially acceptable drug. Just as with other drugs, alcohol leads to an altered state of consciousness and increases an individual's risk behavior, such as the use of marijuana, cocaine and other illicit drugs.<sup>7</sup>

In terms of illicit drug consumption, those most commonly used by students, particularly at the end of their course, were solvents and marijuana.

Behaviors related to sexual practices showed significant differences between the two groups. While students at the end of their course reported greater sexual activity, their condom use was less. This result by relate to a possible increase in the numbers of stable relationships among young people at the end of their studies. However, this makes the results no less worrying, since it means that young people are running a greater risk of exposing themselves to sexually transmitted diseases.

Attitudes to do with weight showed that students at the end of their course were more interested in maintaining or losing weight and the most common response reported by young people for dealing with this was physical exercise. It may be that the university environment and knowledge of good health had encouraged students to exercise, although this result may also be related to trends in wider society to attend gyms more regularly, rather than any intention to be healthier.

In conclusion, in general, health behaviors did not show significant differences between students at the beginning and end of their courses, in spite of the knowledge acquired during their studies.

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