Fundació GALATEA

Study on Health, Lifestyles and Academic Conditions of Medical Students in Catalonia

The health of medical students

Reports and Studies

Fundació GALATEA

STUDY ON HEALTH, LIFESTYLES AND ACADEMIC CONDITIONS OF MEDICAL STUDENTS IN CATALONIA

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Working group: Manel Salamero (dirección)
Lucía Baranda
Anna Mitjans
Eva Baillés
Marina Càmara
Gemma Parramon
Eduard Gómez
Antoni Arteman
Jaume Padrós

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Presentation

The Galatea Foundation was founded in 2001 with the objective of managing psychiatric and psychological care for sick doctors and nurses, as well as promoting the health and physical and mental wellbeing of doctors and all health professionals.

Throughout these years of experience, and 1,700 cases attended to, the PAIMM program has become consolidated as a healthcare and rehabilitation model and reference point for the medical profession both in Catalonia and around the country. In 2007, it opened the Galatea Clinic, a specialized clinical unit in Barcelona, with state of the art treatment equipment.

Within our prevention programmes, we are continuously carrying out in-depth analyses of at-risk groups, broadening the sectors subject to intervention as well as the variety of services.

In 2009, the Galatea Foundation initiated the Medical Student Health Programme. As has been done in Canada, the U.S., Australia and Norway, the leaders in treatment of healthcare professionals, we want to anticipate problems by raising consciousness in students about the importance of taking care of their own health in order to have a healthier future career.

It is well known that the beginning of one's clinical practice is a significant source of stress, due to contact with illness and patients, the complex organization of healthcare systems, pressure in treatment, etc... However, students are in an ideal position to acquire healthy habits and knowledge to confront these situations successfully.

The results of the study we are presenting will allow us to become more familiar with this target group and to design methods of intervention for acquiring healthy lifestyle habits. We believe that a future professional who has good psycho-emotional equilibrium will be better able to help his/her patients.

The study, whose objective is to become familiar with health conditions, lifestyles, health habits and academic conditions of medical students in Catalonia, was promoted by a specific work group, headed by Dr. Manel Salamero, whom we thank for his deep commitment and quality of work.

This project was also made possible thanks to the involvement of deacons, university professors and student association representatives. We also received support from MSD and the Orphans of the Medical College Organization Fund, whom we thank for their collaboration.

Dr. Jaume Padrós i Selma
President of the Galatea Foundation Fund

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1. Introduction

Medical students are known for their brilliant academic backgrounds prior to entering university, which allows them to satisfy the requirements and get through the difficult selection process. During all of their studies they are subject to high performance requirements, and when they begin their clinical training in contact with patients they are exposed to considerable emotional conflict. All of these factors represent significant sources of stress that affect their mental health, in addition to their own psychobiological vulnerability and to other general problems typical of their age. Numerous studies have highlighted the high prevalence of depressive and anxiety disorders[1], suicidal ideation[2,3], stress[4] and emotional exhaustion[5]. The number of students who suffer from disorders of clinically significant intensity are very variable depending on the methodology and the tools used for their evaluation. In general, it is estimated that at some time during their studies, 50% of medical students suffer from emotional exhaustion and around 15% from major depression. As regards our context, in a previous study[6] the prevalence was estimated at 30% among first- and second-year students.

While there don't seem to be differences among students of medicine and other disciplines[7] prior to university, emotional difficulties soon appear. For example, in a longitudinal study of first-year medical students in Glasgow[8], a significant increase was detected in students scoring high for probable mental disorders on the GHQ. Data from the study suggest that this increase was related more with academic stress than with personal problems. The consequences of emotional disorders are projected into the future, as the Guthrie et al. study[9] indicates. These authors evaluated a group of students in their first, fourth and fifth years, and found that the best predictor of mental health status at the end of their studies was the presence of probable pathology at the end of the first year. In the Dahlin i Runescon study[10] it was also observed that the presence of depression in the first year, after controlling for other variables, was a factor predicting psychopathology at the beginning of clinical training, highlighting the influence of personal vulnerability.

To some authors, the beginning of students' clinical studies represents a period of increased stress. Lomis et al.[11] point to many factors related to clinical contact that students identify as stressors. These include the seriousness of patients' illnesses, some characteristics of the health system, training models transmitted by healthcare personnel and, especially, difficulties in communicating with patients.

In addition to symptoms of anxiety and depression, several studies highlight the prevalence of tobacco, alcohol and other drug consumption among this population. In a comparative study of Irish students, Boland et al.[12] find that while tobacco consumption decreased between 1977 and 2002, alcohol consumption and other drug use increased. Studies in other countries, such as the US[13], Brasil[14] and the United Kingdom[15] also warn against the high prevalence of consumption of toxic substances.

The conditions in which medical internships are done can have direct effects on student welfare. Haglund et al.'s study[16] highlights the frequency with which students feel mistreated by their tutors. Several studies[17,18] also warn about sexual discrimination and harassment that both male and female students suffer, although the latter is much more frequent. Dyrbye et al.[19] point to the importance of the teaching environment, including students' perception of the institution's and professors' commitment to their training.

There are obviously many life circumstances that can affect students' mood that are unrelated to academic life, or that have a very indirect affect. As has been observed in the general population, female medical students show higher levels of depressive symptoms than male students, as well as those related to physical distress[20], such as emotional exhaustion[21]. Financial difficulties, especially the subjective perception of these difficulties, have been shown to be a source of stress among students[22].

It's important to consider the consequences of emotional distress in interns[23,24] even if they don't only interfere in the learning process. Both the Thomas et al.[25] and the Laidlaw[26] studies, for example, showed a significant association between emotional exhaustion and a decrease in empathy in relating to patients.

The complexity of the factors affecting students' emotional well-being brought Dunn et al.[27] to formulate an integrative model. They consider each student as having a "reserve" of coping skills for challenges they face in medical training, which depend in part on individual personality factors. Personal problems, as well as academic stress and the high demands of time and energy that medical studies demand negatively affect these skills. The latter are sometimes heightened by protective factors, such as a social support network, a healthy lifestyle, intellectual stimulation, and the help of their tutors and professors. We believe that this model helps to avoid simplistic causal attributions, and will therefore adopt it as a framework of reference for this study.

2. Objectives

2.1. General Objective

To estimate the prevalence of psychological distress, academic stress and study health-related behaviour in fourth year medical students in Catalonia (MS).

2.2. Specific Objectives

» Identify self-perceived health and related health habits.

» Determine the prevalence of toxic habits and general psychological distress.

» Discover academic stress and emotional exhaustion levels in medical students.

» Study the association between mental distress and the sources of academic stress while controlling for other variables that are unrelated to medical studies.

3. Methodology

3.1. Population and Sampling

The statistical part of the survey presented in this report is made up of students registered in the fourth year of medicine in universities of Catalonia during the 2009/10 academic year. In Catalonia undergraduate studies in medicine can be done in seven schools, but the fourth year wasn't yet available while the fieldwork was being carried out in the centers that were most recently founded. Table 1 shows the number of students registered in the fourth year in the centers in Catalonia, as well as the number of surveys carried out.

The final sample is of 420 people, representing 52% of the total of registered students. The absolute margin of error is ±3.38% for a confidence interval of 95.5% and a prediction interval of p=q=50.

Table 1: Medical Students Enrolled in the Fourth Year in Different Faculties of Catalonia

	Students registered in the 4th year		Students surveyed		Participation rate
University of Barcelona	240	29.8%	146	34.8%	**60.8%**
Autonomous University of Barcelona	350	43.5%	162	38.6%	**46.3%**
University Rovira i Virgili	100	12.4%	55	13.1%	**55.0%**
University of Lleida	115	14.3%	57	13.6%	**49.6%**
Total	805	100.0%	420	100.0%	**52.2%**

3.2. Questionnaire

In order to discover health, lifestyle and academic determining factors in students a questionnaire was made with different modules that are described below. The best variables and instruments were selected to evaluate the main dimensions of the study, while guaranteeing that they are validated both in the general population and in the population subject to the study. We have therefore prioritized those used in the health survey of Catalunya[28] to make comparative analyses.

Sociodemographic Variables: We collected data on age, sex, civil status, place of origin and the school where students study. They were also asked about where they live, whether they are on scholarship and if they work to support themselves.

Academic Variables: We collected information about the year in which they began their studies and whether they have been registered in other courses, either before or after.

Health Parameters: In order to discover the health status of the fourth-year medical students, we asked about their height and weight in order to calculate the Body Mass Index (BMI), their perception about their health and the number of daily hours of sleep. The BMI was calculated based on self-reported weight and height (BMI=kg/m^2) and set, based on the Catalonia Health Survey (ESCA) 2006[28], as: *Underweight* (BMI <18.5); *Normal weight* (BMI 18.5 to <25); *Overweight* (BMI 25 to <30; and *Obese* (BMI ≥30). Self-perceived health does not correlate well with a clinical evaluation, but it is an important quality of life indicator. In answering these types of questions, people tend to evaluate both the presence of medically diagnosed diseases and common perceptions of fatigue or unease. This information was collected with the same variable used in the ESCA 2006[28], which classifies health status as Excellent, Very Good, Good, Average, and Poor.

Consumption of Tobacco, Alcohol and Other Substances: For tobacco consumption both self-reported consumption and the age when one started smoking were asked. Alcohol consumption is also based on self-reported data and was calculated using the same group of questions as in the ESCA[28] and for the Barcelona Health Survey (ESB)[29], both from 2006, following recommendations by the National Drug Plans[30]. Information regarding the type and frequency of alcohol consumed was collected, while distinguishing between workdays and weekends. From this data an estimation of the Standard Drink Units (SDU) was made, each being equivalent to 10 grams of alcohol consumed[31]. The population is classified (based on SDU consumed and the number of times that 5 or more alcoholic drinks were drunk at one sitting) as *non-drinkers* (haven't consumed alcohol in the past 12 months), *moderate drinkers* (have consumed <28 weekly SDU for men or <17 for women) and *at-risk drinkers* (have consumed ≥28 UBE for men or ≥17 UBE for women; or have drunk 5 consecutive drinks at least once a month).

Use of tranquillizers or sleeping pills and the most frequent illegal drugs, marihuana and cannabis derivatives, cocaine, amphetamines, and opiates, both in one's entire lifetime and in the last 30 days, were also

asked about. In all these questions about self-reported consumption, we used the same procedure as in the ESCA[28] and the l'ESB[29].

International Physical Activity Questionnaire (IPAQ): In order to measure the physical activity level of students analysed, the IPAQ32 was used, and is the tool used in most surveys on the health of the general population in our field. The self-administered 9-item short version evaluates time spent walking and performing both vigorous and moderate physical activity or sports. With this information and the energy required, measured in METS (metabolic equivalents/minute), an overall energetic index is obtained, so that individuals can be classified as *sedentary*, or with *light*, *moderate* or *intense physical activity*. This tool has been developed in several languages by the EUROHIST Group and validated in a dozen countries. It is included in the ESB[29] and the ESCA[28] from 2006, which serve as reference.

General Health Questionnaire (GHQ-12): This 12-item questionnaire can be used to evaluate the prevalence of people with mental disorders and the presence of anxiety and depression symptoms during the interview[33]. The Spanish version has a sensitivity and specificity rate of over 80% in detecting mental disorders[34]. It has been used in several studies on medical students[9, 8, 22] and is both part of the ESB[29] and the ESCA[28]. We have this information about residents[35] and physicians in Catalonia as well[36].

Big Five Inventory (BFI-10): Personality evaluation in population surveys due to the length of standard questionnaires. As there is still very little experience published in the literature, the BFI-10[37]was selected. This is a 10-item abbreviated form to measure the 5 basic dimensions of personality: Neuroticism (N), extroversion (E), Openness to new experiences (O), Cooperation (A) and Responsibility (C). Especially from 1980 on, these five factors have been considered the most stable and replicated personality dimensions. These five factors have been shown to have a high predictive capacity for numerous behaviours[38] and are related to personality disorders[39,40].

This abbreviated form was developed for use in epidemiological studies, ensuring the stability of psychometric indexes in two languages (English and German). To our knowledge, it hasn't been adapted nor validated in Spanish samples. We therefore proceeded to translate and retrotranslate the items and to analyze their psychometric properties based on our sample. In our study's sample, Cronbach's αreliability coefficient of the scales was α_N = 0.80, α_E = 0.68, α_O = 0.50, α_A=0.08 i α_C = 0.45. A factorial analysis was carried out by extracting five factors and a varimax rotation, and congruent factorial saturations were obtained only for factors N, E and O. In a further study by the authors of the test[41] unclear factorial structures were obtained. Thus, in our study we maintained the neuroticism and extroversion factors that reached sufficient factorial reliability and validity.

Life Events in the Last Year: In the last twenty years numerous studies have demonstrated the relationship between recent life events and both mental health and physical disorders and, at the same time, the difficulties in evaluating them adequately[42]. In short, the lists of situations overestimate the number of significant stressful events with respect to the interviews and do not provide a subjective perception or

evaluation that is more strictly related to the possibility of getting sick. However, in the surveys subjective perception is confused with its effects (symptoms of anxiety and depression) and, on the other hand, the event's impact on health and the perception of it are produced by different mechanisms[43]. With these considerations in mind, as well as the need to maintain the breadth of the survey within reasonable limits, we chose the Mitgaard List[44], which offers 14 situations and which predicted mental health problems in its study with medical students.

Oldenburg Burnout Inventory (OLBI): Maslach[45] was one of the first authors to study emotional exhaustion and its repercussions on the job. His questionnaire could well be the most used, but it is hard to adapt to students since the questions refer to contractual work situations. For this study Demerouti et al's[46] OLBI study was used, which was designed to measure exhaustion in any profession. It evaluates the two most important dimensions of burnout, emotional exhaustion and the lack of work commitment, using the two scales of seven response items in four-point Likert-type scales. It has been used with medical students by Dahlin et al.[21] and with physicians by Pompili et al.[47]. Since we are unaware of the questionnaire's being adapted to our context, after translation and back translation, its reliability in our sample was calculated. In our sample, a Cronbach coefficient α of 0.80 was obtained for the Exhaustion scale and of 0.67 for the Lack of Commitment scale.

Learning Environment Questions: These questions were developed by Dyrbye et al.[19]. Based on previous studies, they identified the most frequent potentiating or buffering academic sources of emotional exhaustion in medical students. It consists of 14 questions with five-option Likert scales that measure satisfaction with tutors' and professors' support, supervision and institutional involvement.

Sexual Harassment: There are no standardized questionnaires to measure this construct[17] and the questions formulated vary from study to study. After revision, four direct questions were chosen that cover the most commonly reported behaviours in the bibliography.

3.3. Procedure

The medical student survey was designed to be self-administered in class in order to ensure access to a greater number of students and greater representativeness of those who regularly attend class.

The study was first presented to the rectors of the participating universities and to the deans of the respective faculties of medicine for their authorization. The project was then presented to the student representatives to request their active collaboration in facilitating and motivating student participation.

The most appropriate place and time to administer the class survey was agreed upon together with the academic heads and student representatives. The times of highest student attendance were taken into account based on each center's internal dynamics. In no case was prior notice given for the day of the survey, in order to ensure an attendance level that was similar to any other class.

Once in the classroom, the Galatea Foundation's investigating team explained the objective of the study to the students and requested their voluntary participation while guaranteeing the confidentiality of data provided. The questionnaire was then handed out and, in order to guarantee anonymity, the students themselves put their completed sheets into a sealed ballot box. A completed and turned-in questionnaire was considered a tacit indicator of willingness to participate in the study. A consent form was also collected with the personal data of students interested in participating in further longitudinal or follow-up studies. This form was collected separately from the questionnaire, making it impossible to link the data provided. In an attempt to take advantage of the participation of students who were absent on the day of the survey, questionnaires were distributed through the student representatives with the option of leaving them in the sealed box.

A total of 52.2% of the fourth-year medical students of Catalonia participated. This percentage varied between 46.3% and 60.8%, depending on the university. These figures correspond to the percentage of students present in class over the total students registered and therefore measure the rate of absenteeism and not the response rate. The latter rate was practically 100%, since all students filled out and handed in their questionnaire. Only some Erasmus students (approximately one or two per course) were exempt from filling out the questionnaire.

Just over half filled out the consent forms (59% of the students present), also with significant differences between faculties: between 17% and 84%.

The answers to the questionnaire were entered into Excel and SPSS database formats, which are compatible with other statistics programmes. In order to minimize errors derived from data entry, the process was duplicated in 10% of cases. An in-depth separation of the results file was also carried out to detect and clear up internal inconsistencies and values that were outside the range of the total data entered.

For quantitative variables the mean and deviation standard of the total were calculated for both men and women. Comparisons between the sexes were done through Welsh *t* tests, which is a modification of the student test by correcting inequality of variances. The qualitative variables were tabulated by total and by sex, in this case through comparisons with χ^2 squared tests. The z test was done for percentage comparisons for independent groups.

As we said above, some of the variables of our study coincide with those of the 2006 edition of ESCA[28]. This survey is aimed at the total population of the Catalonia census without an age limit, whose sample includes 18,000 active citizens. The idea was to extract a subsample of students with the most similar characteristics to our sample and a sufficient number of active students to make a comparative analysis. The ESCA does not ask those who are self-defined students which type of studies they are pursuing at the moment of the interview, but intraining is available regarding their current situation and activities, as well as the academic level achieved. With this data, self-defined students 21 years and older and who had finished secondary school, upper-level training courses or university studies have been selected. In the end, this subsample is composed of 236 active people, 55% of which are men (130) and 45% women (106).

Taking into account, however, that the internal characteristics of both groups are not exactly the same, the comparative analyses, which were done using the same tests described above, should be considered preliminary and centered on orienting tendencies.

In addition to these descriptive analyses, other tests were done that will be detailed in their respective sections. The statistical analyses were carried out with the R programme, version 2.12.2[48].

4. Results: Descriptive Data

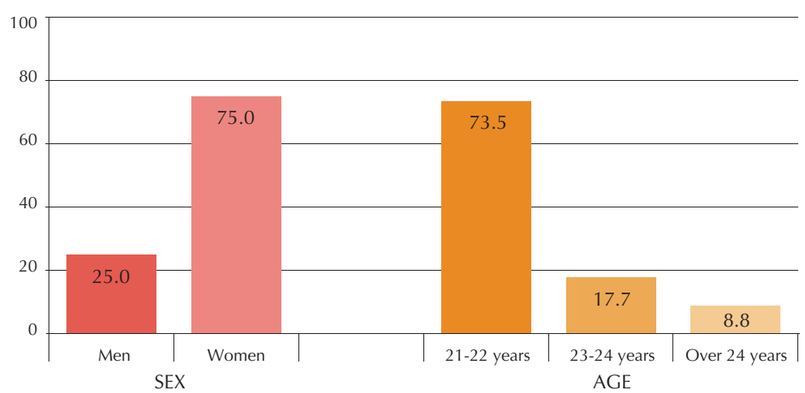
In this section we will briefly comment on the main characteristics and opinions of medical students as compared, when possible, to students of the same age in the general population.

Tables with the results of all variables included in the questionnaire separated by sex are presented in the annex.

4.1. Sociodemographic Data

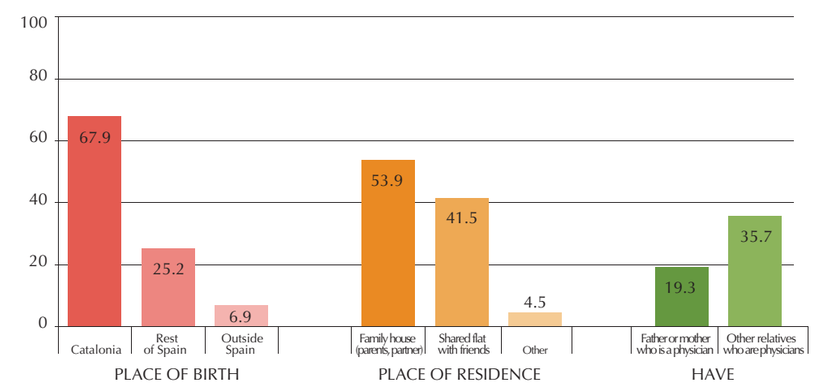
Women predominate among the fourth-year medical students, representing 75% of students. Twenty-two-year-old students also predominate, which is the age that corresponds to this course for students who have not interrupted their schooling in a significant way. In fact, the average age of this group is about 22.8 with no significant differences between men and women.

Graph 1: Sex and Age of 4th-year Medical Students Participating in the Survey. Catalonia 2010



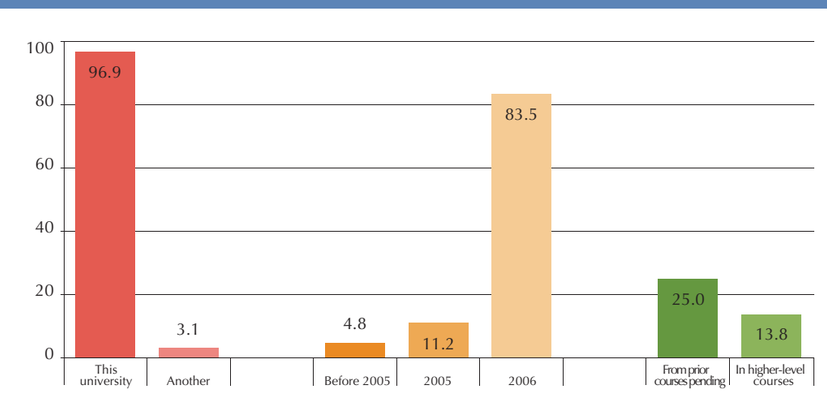
67.9% of students from the sample were born in Catalonia and 25.2% in the rest of Spain. Over half (53.9%) live at home, and 41.5% in shared flats with other students. 19.3% have a parent who is a physician, and 35.7% have a close family member in the medical profession. There are no significant differences between men and women in any of these characteristics.

Graph 2: Sociodemographic Data of 4th-year Medical Students: Place of Birth, Place of Residence and Relatives who are Physicians. Catalonia 2010



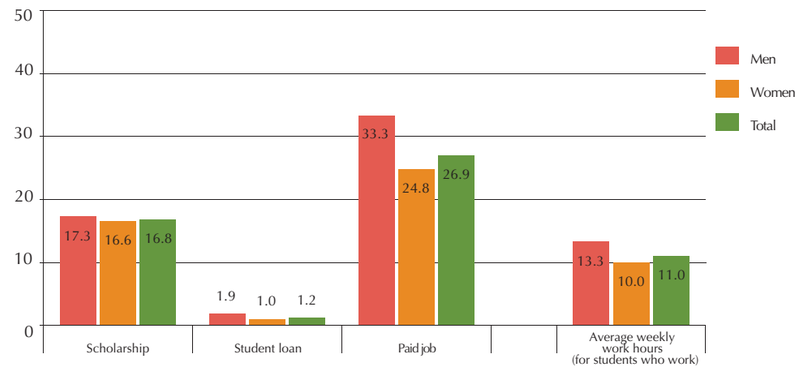
These students study in all of the teaching units of the four Catalan universities who offer fourth-year studies. Almost all the students (96.9%) started their studies at the same university, and only a few transferred from other schools. The vast majority began their university studies in 2006. A quarter of them (25.0%) have subjects that have to be retaken in other courses and 13.8% are studying on other high-level courses. There were no significant differences between the sexes in these characteristics.

Graph 3: Academic Situation: University Where First Enrolled, Year Began and Subjects Completed. Catalonia 2010



16.8% of students have a scholarship, and the number who pay for their studies with bank loans is almost insignificant (1.2%). Just over a quarter have some kind of paid job, working an average of 10 hours per week. There are no differences between men and women in these economic variables.

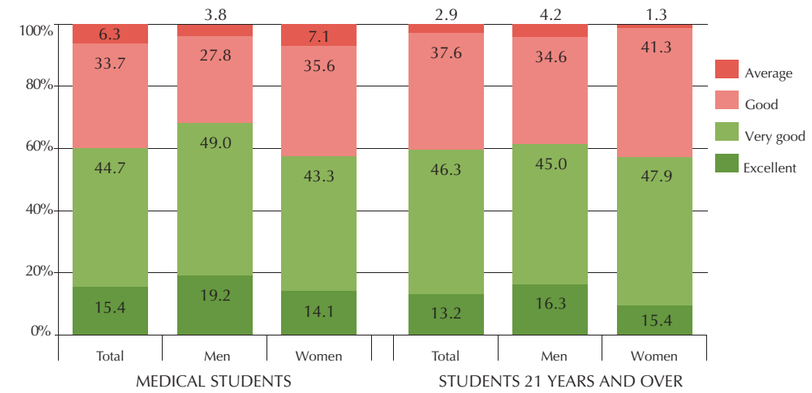
Graph 4: Funding of Studies for 4th-year Medical Students. Catalonia 2010



4.2. Health

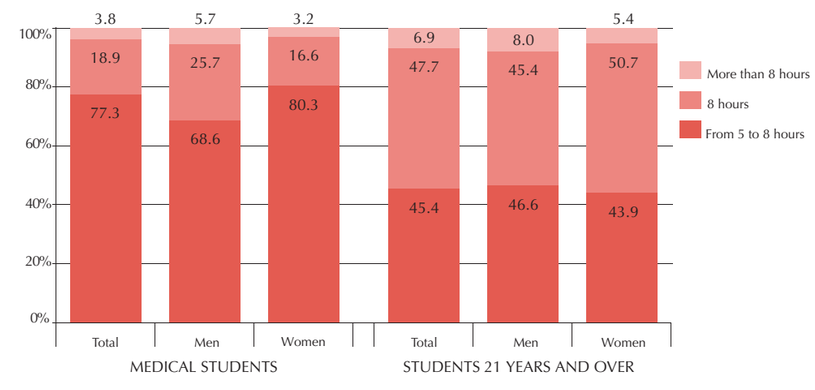
The health self-evaluation is a subjective judgment of the person answering the survey, considering both his/her subjective perception of illness as well as common symptoms, such as exhaustion or general suffering. It is less related to medical assessments[49] but more to the use of health services, medication and quality of life.

Graph 5: Self-perceived Health Status, by sex. Comparative data with students from the general population ≥ 21 years of age (ESCA 2006)



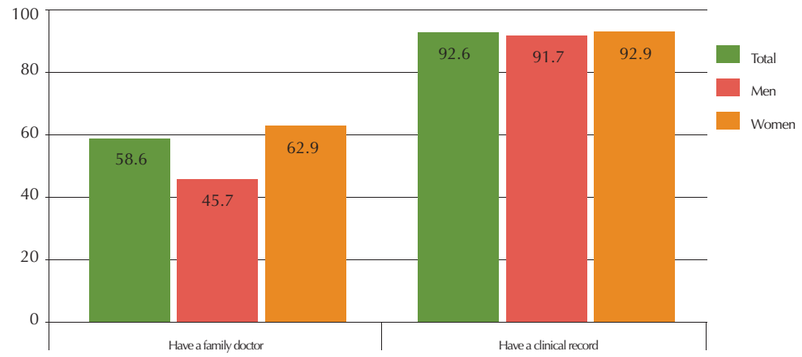
As can be expected in a young population, the health self-evaluations are positive, and none of the students consider themselves to have poor health. There are no differences in scores between men and women. However, the score distribution for women differs significantly (x^2 =19.33, P <0.001) from that of other students. In **Graph 5** we can see a higher polarization in medical student self-evaluations.

Graph 6: Average Duration of Sleep, by sex. Comparative data with students from the general population ≥ 21 years of age (ESCA 2006)



The fourth-year medical students sleep just over seven hours in the case of men (7.2) and less in the case of women (7.0). The difference is statistically significant (P=0.012). Both groups sleep less than other students of their age (P <0.001 both in men and in women).

Graph 7: 4th Year Medical Students Who Have a Family Doctor and/or Clinical Record. Catalonia 2010

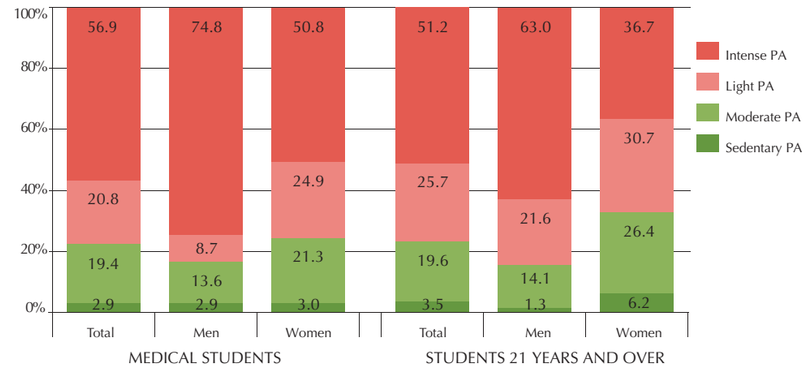


Both male and female medical students have open clinical records (91.7% and 92.9%, respectively). Relatively few state that they have a family doctor, however (45.7 and 62.9%). This could indicate low use of health services by the young population, although the fact of having a father or mother who is a physician does play a role: 70% of students with parents who are physicians do not have a family doctor.

Physical activity is one of the components of a healthy lifestyle. Studying requires long periods of sedentary behaviour that has to be counteracted with regular physical exercise. We have used the IPAQ to evaluate this in metabolic units, based on duration of the activity (METS). With this index, students are defined as inactive or engaging in light, moderate or intense physical activity.

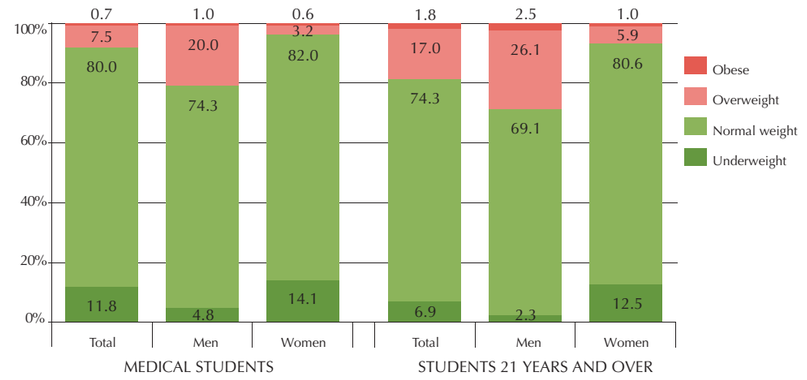
In **Graph 8** we see that male students have a significantly higher physical activity level than the women. In both groups the percentage of inactive students is very low (2.9% and 3.0%, respectively). Intense physical activity is significantly higher in male medical students (74.8%) than in female students (50.8%).

Graph 8: Physical Activity Index, by sex. Comparative data with students from the general population ≥ 21 years of age (ESCA 2006)



When compared with other students of the same age, we see that the pattern of male medical students is similar and without significant differences (P=0.550). On the contrary, female medical students tend to partake less in physical activity, although the difference does not reach statistical significance (P=0.088).

Graph 9: Body Mass Index (Declared BMI), by sex. Comparative data with students from the general population ≥ 21 years of age (ESCA 2006)



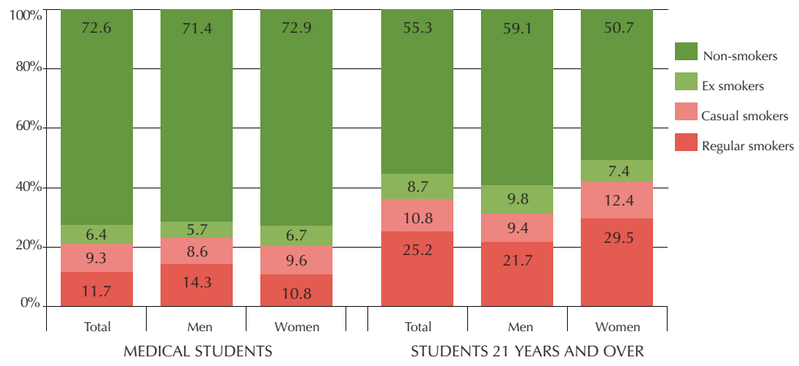
The Body Mass Index (BMI) is most commonly used to evaluate weight as compared to that of the general population. In the case of medical students, those whose BMI parametres are considered within normal or healthy predominate. Just as we see in Graph 9, there are significant differences between men and women: The percentage of women with what is considered to be below normal weight (BMI <18.5) is much higher than that of men: 14.1% compared to 4.8%. There is also a higher percentage of overweight men (20%) than women (3.2%). As compared with other students of the same age, the differences are not very significant although there are more overweight people in this group, among both men and women.

4.3. Tobacco

Tobacco consumption is the cause of numerous illnesses in adults, but in general this habit is acquired in adolescence and in early adulthood. People are normally classified as regular or casual smokers, ex-smokers and smokers. Among fourth-year medical students those who have never smoked predominate, at around 70%, with little difference between the sexes.

The percentage of regular smokers among fourth-year medical students is 14.3% in men and 10.8% in women. It is noteworthy that these percentages are significantly lower in both sexes compared with other students of the same age (P = 0.087 and x^2 =27.29, P <0.001), especially among women.

Graph 10: Tobacco Consumption by sex. Comparative data with students from the general population ≥ 21 years of age (ESCA 2006)

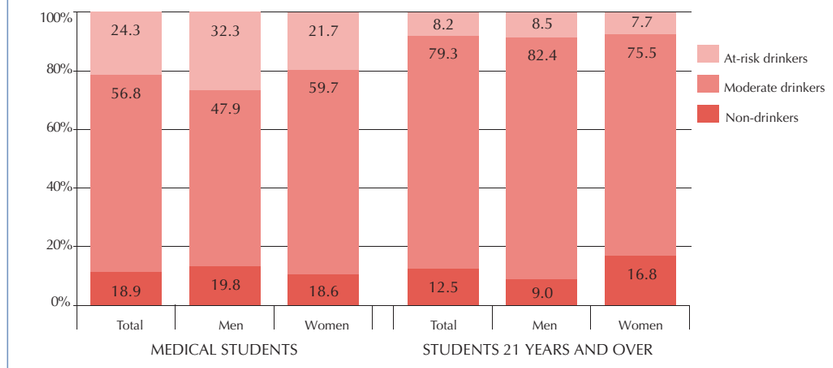


The number of regular or casual smokers who have tried to quit in the last year is considerable, at about 30%.

4.4. Consumption of Alcohol and Other Drugs

Graph 11 shows the data on alcohol consumption. Weekly frequency of consumption of different types of drinks was asked about (wine or champagne, beer, liquor and high-grade alcohol) separately for weekdays and weekends. The quantity consumed was calculated in Standardised Drink Units (SDU), corresponding to 10 grams of alcohol each, based on this data. A moderate drinker is said to drink less than 17 SDUs among women and 28 among men. Higher weekly consumption, or habitual consumption of five or more consecutive drinks are considered at-risk behaviour.

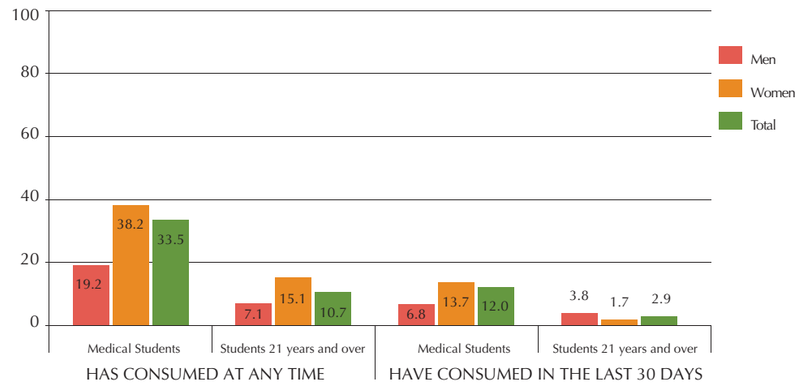
Graph 11: Alcohol Consumption by sex. Comparative data with students from the general population ≥ 21 years of age (ESCA 2006)



The number of at-risk drinkers is high among medical students, the findings being 26.7% of men and 19.8% of women. The most common at-risk drinkers are those who have five or more consecutive drinks at one sitting, which reflects the frequency of weekend drinking. It is important to note that this pattern of consumption is considerably higher than in other students, both in men (P <0.001) and in women ($\mathcal{P}$ =0.002).

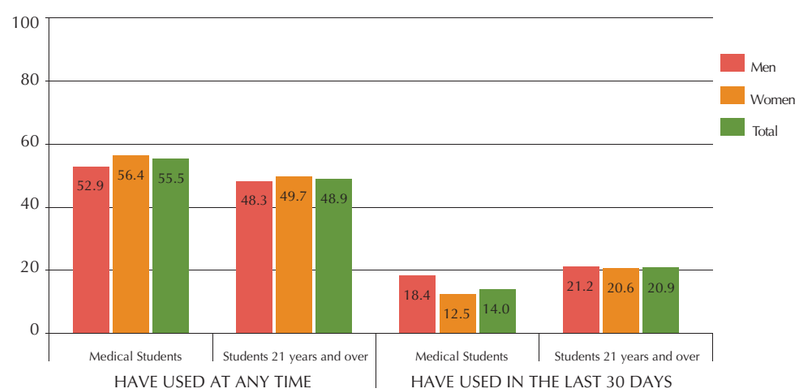
Students were asked if they had used any other addictive substances at any time, including tranquillizers, cannabis derivatives, cocaine, and heroin.

Graph 12: Consumption of TRANQUILLIZERS At Any Time Or In The Last 30 Days, by sex. Comparative data with students from the general population ≥ 21 years of age (ESCA 2006)



The question regarding use of tranquillizers made no distinction between medications prescribed by a physician and self-prescribed ones. Tranquillizer use is very high among medical students, especially among women (38% have used them at some point in time and 13.7% in the last 30 days). This level of consumption is significantly higher than that of other students, both in men and in women (P =0.040 and P <0.001, respectively).

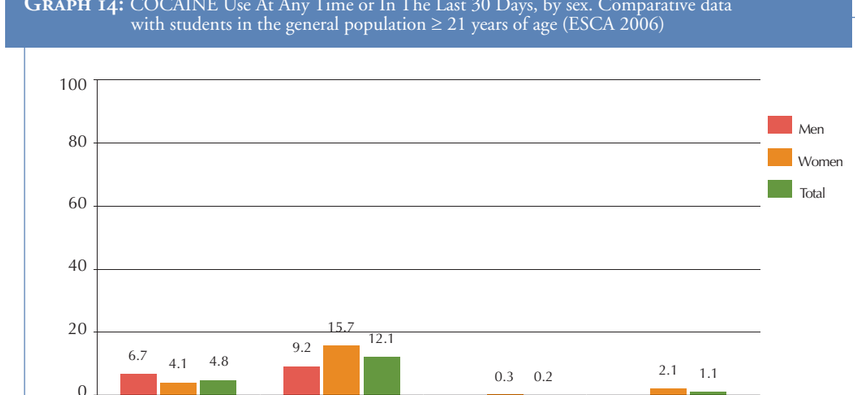
Graph 13: Use of CANNABIS DERIVATIVES At Any Time Or In The Last 30 Days, by sex. Comparative data with students in the general population ≥ 21 years of age (ESCA 2006)



More than half of students had used marihuana at some time, a very high level, but similar to that of other students. Cocaine consumption among medical students is around 5% (6.7% in men and 4.1% in women), less than that observed in other youths of the same age, especially in the case of women (P <0.001).

None of the students had used heroin, which is infrequent nowadays among youths.

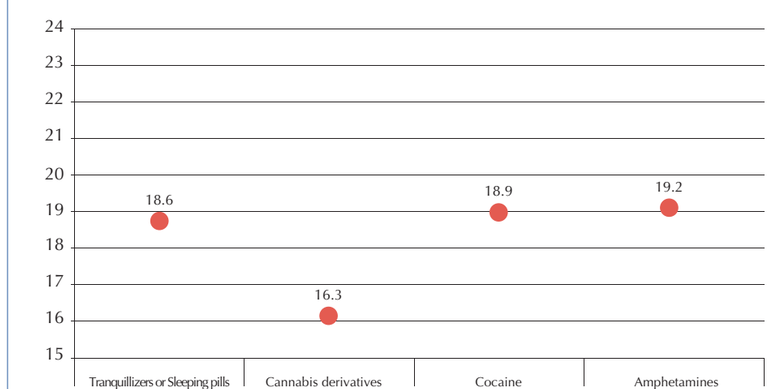
Graph 14: COCAINE Use At Any Time or In The Last 30 Days, by sex. Comparative data with students in the general population ≥ 21 years of age (ESCA 2006)



As shown in **graphs 12 to 14**, self-reported consumption referring to the last 30 days follows a similar pattern.

The age at which they start using these substances does not differ significantly between men and women. Students start using cannabis on average before starting their medical studies, while the consumption of tranquillizers, cocaine and amphetamines coincides, on average, with the beginning of their studies.

Graph 15: Age in Which Students (who consumed) Started Using Different Substances. Catalonia 2010



4.5. Mental Health

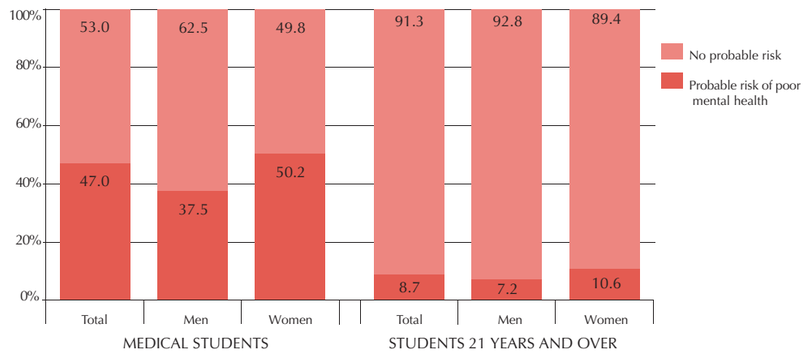
Mental health status was evaluated using the General Health Questionnaire (GHQ). This tool evaluates the presence in the last month of anxiety and depression symptoms and difficulties or lack of interest in carrying out productive or social activities on a daily basis. The presence of three or more symptoms as an at-risk indicator for suffering from a mental disorder is accepted as a sampling tool.

Table 2: General Health Questionnaire (GHQ) and Personality Questionnaire

	Total		Men		Women		p	n
GHQ Score	3.1	3.04	2.43	2.85	3.32	3.08	0.008	417
GHQ 2/3							0.038	417
Probable normal mental health	222	**53.2%**	65	**62.5%**	157	**50.2%**		
Probable risk of poor mental health	195	**46.8%**	39	**37.5%**	156	**49.8%**		
BFI								
BFI Neuroticism	5.73	2.1	6.92	1.71	5.33	2.07	<0.001	420
BFI Extroversion	5.88	1.8	5.98	1.75	5.85	1.82	0.523	417

In our sample, women have significantly higher scores than men (3.3 and 2.4, respectively, P =0.008). When one considers the probable risk of suffering from a mental disorder, especially anxious or depressive disorders, the numbers are very high and significantly higher (P <0.001 in both sexes) than those observed in other students of the same age.

Graph 16: GHQ Mental Health Index by sex. Comparative data with students in the general population ≥ 21 years of age (ESCA 2006)

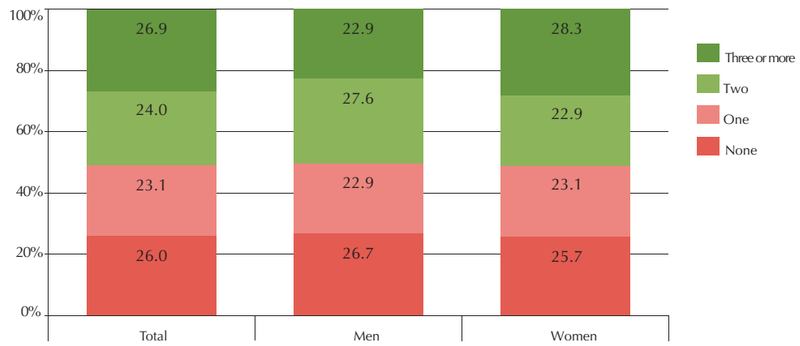


The two personality dimensions, neuroticism and extroversion, are also analyzed and shown in **Table 18**, for which we have no comparative data with that of other students. Interestingly, women get higher scores in neuroticism (P <0.001), consistent with the higher presence of symptoms detected in the GHQ questionnaire. This data will be used to study the relationships between psychological disturbances in Section 5.

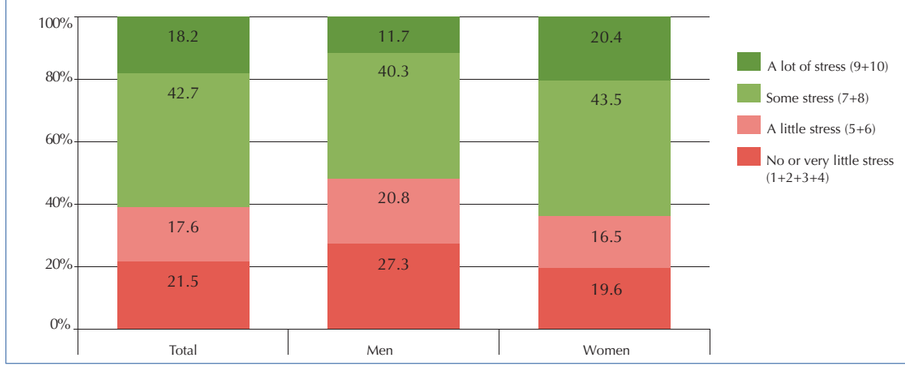
4.6. Life Events

Many variables influence psychological well-being, and among those worth highlighting are adverse events that happened in recent months. In the survey students were asked if they had suffered any kind of loss of family or friends, economic or legal difficulties or other negative circumstances. Sixty-six % of students stated that they had suffered one or more adverse life events, to which they attributed a high stress effect on a Likert scale of 1 to 10.

Graph 17: Number of Adverse Life Events Suffered by 4th-year Medical Students in the Last year. Catalonia 2010



Graph 18: Declared stress levels by medical students who have suffered from some adverse life event. Catalonia 2010



4.7. The Academic Environment

Many studies have described how the large amounts of effort and stress implicit in studying medicine produce emotional exhaustion syndrome or *burnout* in students. In this study, the Oldenburg Burnout Inventory was used to evaluate two dimensions of exhaustion syndrome: exhaustion itself and the loss of involvement in activities. Each dimension is measured with the mean of set items scored from 1 to 4.

Table 3: Oldenburg Burnout Inventory (OLBI) Scores

	Total	Men	Women	p	N
Exhaustion	2.26 (0.51)	2.49 (0.49)	2.18 (0.49)	<0.001	420
Lack of commitment	2.02 (0.42)	2.04 (0.44)	2.01 (0.42)	0.590	420

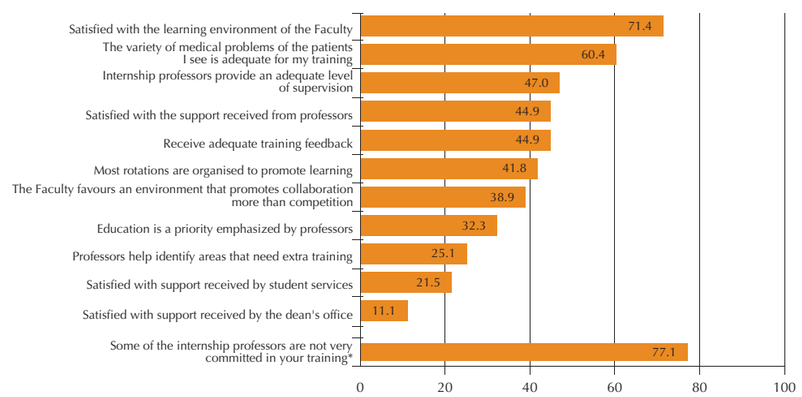
*The **emotional exhaustion** scale includes the following items: I always find new and interesting things in my studies; I speak negatively about my studies more and more; lately I tend to be less committed to my studies and I do them as a routine; I consider my studies to be a positive challenge; I can disconnect from my studies; I can't see myself doing another career than this one; I feel increasingly committed to my studies.*

*The **Lack of commitment** scale includes the following items: I tend to need more time to relax and feel better than before; I often feel mentally exhausted; When my day ends, I have enough energy for leisure activities; When my day ends, I usually feel tired; Some days I feel tired before starting classes; I have good resistance to the pressure of my studies; When I study, I often feel like my batteries are charged.*

There are no normative values, but the results of our sample are similar to those obtained by the Dahlin et al. study[10] in samples of Swedish medical students. These scales will be used to study variables relating to psychological disturbance.

Table 22 shows a group of questions about satisfaction with the student's learning environment and refer both to institutions and to the professionals involved. The items come from a study by Dyrbye et al.[50], with a few modifications to adapt them to our context. They are to be answered in five-point scales from very satisfied to very unsatisfied.

Graph 19: Fourth-Year Medical Students Who Agree With And Are Satisfied With Different Aspects of The Faculty (Answers very satisfied + satisfied). Catalonia 2010



In none of the thirteen questions were there significant differences between male and female students, and we will therefore comment on the overall results. 71.1% of students are satisfied with the general learning environment of their faculty, although fewer consider that education is a priority of the professors (32.3%) or feel that the faculties promote an environment that favours collaboration (38.9%). Satisfaction with support received by tutors, in the faculties where this professional figure exists, is high (62.7%), but they don't feel very supported by student services (21.5%) or the dean's office (11.1%).

Regarding their internship, less than half of students (47.0%) believe that they receive adequate supervision, and a large majority (77.1%) consider that some of the professors are not involved enough. On the issue of the substance of the internship, 41.8% considers that it is organised to promote learning, and 60.4% believe that there is an adequate variety of medical problems. Only 44.9% of students believe that they receive adequate *feedback*, and only 25.1% think that professors help them to identify the weak points in their training.

In order to understand the structure of students' opinions regarding their educational environment, a factorial analysis was carried out. This technique allows us to infer the underlying structure of relationships between the answers and the questions. Since many students stated that they do not have a tutor, the question about faculty tutors was left out of the analysis. Two or three factors were extracted for exploratory purposes, followed by a varimax rotation, and the most interpretable solution to the two factors was chosen.

Table 4: Factorial Analysis of Opinions Regarding Studies

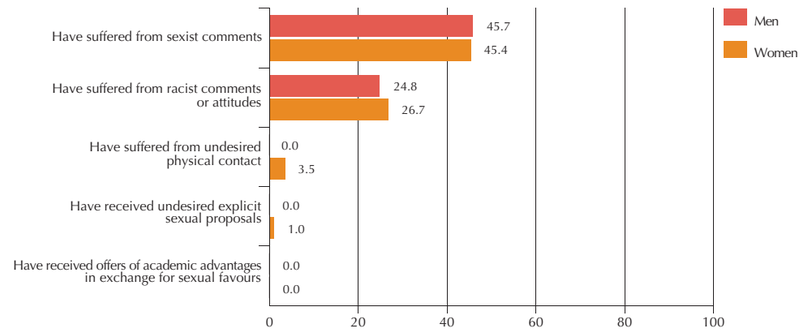
	Factor 1	Factor 2
Global satisfaction with the learning environment	**0.607**	0.263
Professors highlight education as a priority	**0.715**	0.288
The faculty promotes an environment that is more collaborative than competitive	**0.411**	0.253
Satisfaction with support received from Student Services	**0.310**	0.299
Satisfaction with support received from the Dean's Office	0.211	0.172
Satisfaction with support received from professors	**0.667**	**0.352**
Internship professors provide an appropriate level of supervision	**0.367**	**0.591**
Low professor involvement in the internship	-0.193	**-0.334**
Most rotations are organised to promote learning	0.242	**0.597**
There is an adequate variety of medical problems to promote learning	0.218	**0.542**
Adequate educational *feedback* is provided	**0.482**	**0.639**
Professors help identify areas that need additional training	**0.347**	**0.519**
Explained variation	**18.9%**	**18.7%**

Saturations of over 0.3 are written in bold.

The two factors explain the 37.6% variation. The first factor is saturated by questions referring both to institutional support and that of professors, while the second is more saturated by questions related to practical training. These two dimensions will be used in analyzing the variables relating to student suffering and, based on the scores, will be called "General Dissatisfaction" and "Dissatisfaction with Internships."

In all communities, situations of violation of people's rights can occur. This is why we asked students if they had suffered from sexual or racially motivated harassment.

Graph 20: Perception of Sexual Harassment or Racist Attitudes in the Academic Setting by Fourth-year Medical Students by Sex – Catalonia 2010



As we can see, a high proportion of students report perceived sexual and racist attitudes on behalf of professors or other professionals of the campuses. In both questions there are no differences between men and women (P=0.955 and P=0.798, respectively). As the question was formulated, it is not possible to determine whether the answer refers to situations in which the person has been subjected to a negative commentary or if they were witness to it. Explicit sexual proposals and undesired physical contact are very infrequent. It is also worth mentioning that there are no affirmative answers regarding offers of academic advantages in exchange for sexual favours.

5. Results: Relationship with Psychological Distress

In this survey we have three indicators of psychological distress: the General Health Questionnaire (GHQ) and the two subscales of the Oldenburg Burnout Inventory (OLBI). While the first measures risk of suffering from a mental disorder, especially forms of anxiety or depression, the OLBI evaluates the dimensions of exhaustion and disinterest in academic activities.

The factors influencing any of these variables are multiple, and we therefore will not discuss "the cause," but variables that could be related. In general, we must recognize that transversal studies are not conclusive regarding possible causal relationships since interactions between variables can be inverse with respect to those created or to bidirectional ones. Despite these limitations, one of the objectives proposed is to analyze the repercussions of dissatisfaction with one's workload on the emotional state of medical students.

5.1. Risk of Psychopathological Disorders

As mentioned above, the GHQ provides a quantitative score regarding the perception, in the last month, of symptoms relating to emotional suffering, including anxiety, depression and the loss of interest in social contexts. As a sampling tool, a score of three or more indicates a risk of suffering from a mental disorder. The version of the GHQ that we have used in this study is the one that is usually used in epidemiological studies and it has approximately 80% sensibility and specificity.

The probability of suffering from a mental disorder depends on numerous factors that should be taken into account before attributing it to dissatisfaction with perceived support received in studies. Genetic aspects are as important in determining an individual's predisposition to developing mental disorders as are environmental ones. Adverse and stress factors affect this predisposition and activate it, while sufficient environmental support acts can act as a buffer.

In our analysis we have opted for a hierarchical logistic regression model to explain the presence or absence of the risk of suffering from a mental disorder. We first introduced personality variables as predictors and as indicators of vulnerability. Neuroticism, the tendency of demonstrating extreme responses to stressful situations, such as anxiety and depression, is the most frequent predisposing factor found in studies. Extroversion, which implies interest in and capacity for interpersonal relationships, helps the subject to establish a network of relationships and support, acting as a buffer against the effects of stress, and has a protective effect against anxiety and depressive disorders. At the same time, however, as it suggests a tendency towards disinhibition and a search for stimulating situations, it is associated with alterations in control of impulses and with consumption of stimulating substances.

We then introduced the presence of adverse life events into the model. Just as we mentioned in the description of the study, 66% of students say they have suffered as least one important life event that caused them significant levels of stress in the last year. This dichotomized variable was used in this analysis, since it quantitatively presents a very biased distribution.

Finally, we then introduced the two factors related to satisfaction with teaching conditions and support received by students. The first is a general factor saturation for almost all questions, while the second is more related to the internship.

In the following table, the results of the hierarchical logistic regression are presented. In general, the model is significant (P <0.001) with a R^2 Nagelkerke coefficient of 0.12.

Table 5: GHQ Logistic Regression Model

Variable	β	*z*	*P*
Neuroticism	0.13	2.50	0.012
Extroversion	-0.13	-2.12	0.034
Life events	0.98	3.77	<0.001
General dissatisfaction with teaching	0.40	2.86	0.004
Dissatisfaction with internships	-0.18	-1.30	0.195

As was predictable with neuroticism, the presence of adverse life events in recent years contributes in a very significant way (P=0.012 and P <0.001) in predicting an individual's suffering from a mental disorder. Extroversion, which, as we said before, can have either a protective or facilitating effect, also achieves statistical significance (P=0.034). Considering the influence of these variables, an unfavourable opinion about the quality of teaching is also associated with a greater probability of having a mental disorder (P =0.004).

5.2. Emotional Exhaustion from Studies

Emotional exhaustion when confronted with activities is the main dimension of burnout syndrome. In this case, we have made a hierarchical linear regression, since this is a continuous variable and has an approximately normal distribution. We first introduced personality variables into the model, followed by adverse life events and finally the two factors summed up as student satisfaction with the teaching environment and learning conditions. The results are shown in the following table.

Table 6: Logistic Regression Model for Emotional Exhaustion

Variable	β	*z*	*P*
Neuroticism	0.09	8.15	<0.001
Extroversion	-0.04	-3.19	<0.001
Life events	0.21	4.01	<0.001
General dissatisfaction with teaching	0.11	3.91	<0.001
Dissatisfaction with the internship	-0.02	-0.81	0.421

In this model, highly significant values are also obtained in the predictors of personality (P <0.001 both in neuroticism and in extroversion) and in the presence of life events in the last year (P <0.001). After controlling for the effect of these variables, general dissatisfaction with teaching also emerged as a predictor of emotional exhaustion (P <0.001).

5.3. Disinterest in Studies

Besides manifesting itself as emotional symptoms, *burnout* is also closely related with demotivation and a loss of interest in activities. We modeled this variable, as in the previous case, using a hierarchical multiple linear regression with the same predictors. The results are presented in the following table.

Table 7: GHQ Logistic Regression Model for Disinterest in Studies

Variable	β	*z*	*P*
Neuroticism	0.02	2.55	0.011
Extroversion	-0.03	-2.92	0.004
Life events	0.02	0.50	0.620
General dissatisfaction with teaching	0.17	6.84	<0.001
Dissatisfaction with internships	0.04	1.60	0.111

The lack of motivation or interest in studies is, predictably, related to personality factors (P =0.011 with neuroticism and P =0.004 with extroversion). It is not related to having suffered from adverse situations in the last year (P=0.620) and is especially associated with general dissatisfaction with teaching and academic support.

6. Discussion

The sample studied represents 52% of all students registered in the fourth year of the different faculties of medicine of Catalonia. The response rate is similar on the four campuses that offered this course of study for the academic year 2009-2010. As previously mentioned, the questionnaires were distributed in the most well-attended classes following the indications of the class delegates of each campus. In total, only two students left the classroom once the project was explained and their collaboration was requested. We were therefore able to obtain answers from practically all of the students who attended the class selected. It is always difficult to understand the possible differences between students who regularly attend class and those who tend to be absent. As regards their academic performance, however, there is no reason to imagine that the students who were absent are any different from those present, since the drop-out rate from the fourth year on is low. The data regarding the students surveyed showed that 25% still have basic subjects pending and 14% have advanced subjects pending. It is, therefore, pretty frequent to be registered for different subjects in different courses, and one must imagine that in these cases, attendance is divided between the different courses. We therefore consider the sample obtained to be representative of medical students who contact our clinic, which is the target group of our study.

75% of the sample studied are women, which coincides with indicators of feminization of the university population. 68% of the sample were born in Catalonia, and only 7% are from outside of Spain. In 19% of cases one of the parents is a physician, and 36% have a close relative who is a physician. Although we don't have comparative data with other professions, a significant influence can be inferred from the choice to study medicine based on experiences within the nuclear family. More than half of the students continue living with their family, which could indicate close support. Almost three quarters of students do not have a paid job, and those who do work an average of 10 hours a week. Only 17% have a scholarship. The majority of students therefore depend economically on their parents and have time for their studies.

Self-perceived health is good, and no differences have been detected between the sexes nor with respect to other students of Catalonia of this age group. Although self-perceived health is not very related to clinical assessment, it is a quality of life indicator, and when it is negative it becomes associated with absenteeism from work[51]. Although 93% state that they have an open medical file, 54% of men and 37% of women from the sample say they don't have a family doctor, which is an indicator of low usage

of health services and coincides with a high perception of one's own health.
The average duration of sleep is seven hours, and is significantly lower in women than in men. The difference between the groups is a half hour, which is clinically significant. Duration of sleep is less than the norm for young adults in the general population, but it coincides with results obtained by Frank et al.[52] in U.S. medical students. In a longitudinal study, West et al[53] highlight an indirect association, which is influenced by depressive symptoms and emotional exhaustion, between a low number of hours of sleep and the later perception of errors in residents.

Physical activity levels of male medical students are notably higher than that of females. In both sexes it is more polarized than in students in the general population of Catalonia, there being both a higher percentage of inactive medical students and also of those who carry out intense physical activity. In our sample, the number of subjects qualified as physically inactive is less than 3%. Frank et al.[54] state that an active lifestyle in medical students usually is maintained for the duration of their studies and is associated with a greater tendency to advise and promote physical activity in their patients.

The self-reported body mass index (BMI) puts 5% of men and 14% of women medical students in the underweight category (BMI <18.5). These values are similar to those found in the total population of Catalonia students as a whole. Upon investigation of international publications, we have found few studies that take this variable into account in medical students. In a study done with Chinese medical students the BMI was correlated as much with concerns about body image as with eating behaviours[55]. Therefore, even though a low BMI does not necessarily imply the presence of an eating disorder, it is one of its possible manifestations and should be a cause for concern. In the case of male students, even though the fact that 19% are overweight coincides with the rest of students of Catalonia, this should also be taken into consideration.

The prevalence of regular smokers among medical students is about 14% in men and 11% in women. This prevalence is slightly less than in the group of students of the same age in Catalonia which, in both sexes, is over 25%. In the general population, tobacco consumption has tended to drop in the last thirty years in men of all age groups, and in women only in older groups[56]. There is also a relationship with social class, as the prevalence of smokers is higher among the less fortunate. The sharp difference among medical students surveyed and the strata of students of the same age in the ESCA could be influenced by different factors. The time of data collection should be taken into account for this, as the ESCA data is from 2006. However, changes in the pattern of consumption of addictive substances are slow and don't seem to justify the differences found. Possible differences in social class between medical students and (both university and postgraduate) students of Catalonia as a whole should also be considered. Compared to the prevalence of smoking within our profession in other countries, for example Ireland[12], levels are also low.

In terms of alcohol consumption, a very high number of medical students, over 26% in men and 19% in women, meet the criteria for at-risk drinkers. These figures are much higher than those of other students

of Catalonia. The same criteria included in this category were used in both surveys, both with heavy daily drinkers and with weekend drinkers. On the other hand, the high numbers obtained in medical students are similar to those obtained in other European countries[15, 57]. Weekend drinking sprees are also frequent in these countries. It is disturbing that more than 21% of medical students state that they drink five or more alcoholic drinks at one sitting more than once a month.

The most frequently used illegal substance by medical students is cannabis. At some time in their lives 53% of men and 56% of women say they have used this substance. 13% of men and 14% of women consumed it in the last month. The percentage of contact with other illegal drugs is much lower. 5% of the total sample admits to having used cocaine and 3% amphetamine derivatives, while no one said they had tried heroin. In the case of men and women, marihuana consumption is similar to that of the students of Catalonia as a whole, while the use of cocaine is slightly less. Consumption of tranquillizers is notably high and much higher in women (38% at some time in their lives, and 14% in the last month) than in men (19% and 7%, respectively). In our survey we did not specify whether tranquillizer use is under medical prescription. In any case, these figures are more than double those found in Catalonia students as a whole from this age group.

High alcohol and marihuana consumption, as well as that of prescription drugs such as tranquillizers, in medical students is a serious problem, since habits acquired in this stage of life have a high probability of persisting. As Boland et al.[12] point out, misuse of addictive substances by physicians could cause them to take their patients' addictive behaviours lightly and to be less efficient in promoting a healthy lifestyle.

Medical students' mental health was evaluated with the 12-item epidemiological version of the GHQ questionnaire, and the 2/3 value was used as a cutoff point as in the ESCA[28]. With these conditions, the prevalence of subjects at psychopathological risk is 47%, with significant differences between the sexes (38% in men and 50% in women). These values are significantly higher than those found in the general population of students of Catalonia (7% in men and 11% in women). In studies carried out with medical students in other countries, the prevalence detected with the same tool is very variable, oscillating between 19% in Hungarian students[58] and 57% in students from Singapore[59]. In studies carried out in the United Kingdom with students beginning their clinical studies, Moffat et al.[8] showed a prevalence of 52%, while Guthrie et al. obtained 31%9. As we can see, there are notable differences among studies, even when carried out in the same country. In comparative studies with other students or with the general population higher values are often found in medical students[60, 61], just as we have obtained in the present study.

While interpreting this high at-risk psychopathological prevalence detected through questionnaires, a possible motivating suggestion effect must be considered, because the study of illnesses can result in a poor interpretation or excessive detection of symptoms in the subject him/herself. Azuri et al.62 show how worry and fear of illness and death at the beginning of students' clinical work diminishes in the years that follow. In this study, we have also observed that this fluctuation of anxious cognitions don't interfere

in daily activities, for which it can be considered a normal reaction. Despite this possible overestimation of emotional distress, especially when evaluated through questionnaires, there are more objective indicators confirming high levels of psychopathology. Suicidal ideation, as well as completed suicide, are therefore more frequent in medical students than in the general population[2, 63].

On the whole, 71% of students seem satisfied with their educational environment, but when the different aspects evaluated are analyzed, the results show many that need improvement. We therefore see many indicators of a lack of active commitment by professors. Few students (33%) consider that their training is a priority for professors. This becomes more clear in areas that imply personalized teaching. The lack of *feedback* and low intraining on aspects that need improvement indicate scarce interaction. Internships are not perceived to be centered enough on their learning process, with some professors found with low commitment and low supervision. These perceptions reflect a passive type of teaching with little interaction. Lower satisfaction levels refer to institutional entities, such as student services, with which student satisfaction is as low as 22%.

The possible impact of dissatisfaction with the educational environment on students has been analyzed considering three indicators: psychopathological risk, emotional exhaustion and disinterest in studies. Considering that one's emotional state depends on many variables, this was controlled statistically based on personality variables (neuroticism and extroversion) and on the presence of adverse life events in the last year. Dissatisfaction with academic environment variables was summed up in two factors, one in general and the other more related to internships.

As was expected, all extra-academic variables influence the three indicators considered. After controlling them, however, the association with general dissatisfaction with teaching remains significant, but not specifically with the internship. It is difficult to establish relationships of cause and effect in a transversal study, and the possibility of an inverse relationship must be taken into consideration: emotional stress can lead to a more negative generalized perception of the environment. However, dissatisfaction with internships has also been associated with indicators of emotional distress. Despite this limitation, our data confirm the Dyrbye et al. study[19] and demonstrate the repercussions of emotional dissatisfaction on medical students' moods.

7. Conclusions

The results of the study of the answers of the fourth-year medical students from Catalonia has allowed us to become familiar with the most significant characteristics of their health, lifestyles and academic determining factors.

Regarding health habits, a good level of self-perceived health and physical activity is worth highlighting. The number of hours of sleep is slightly lower than the recommended ones, and there is a marked tendency to be underweight, especially among women.

The number of at-risk alcohol drinkers is high, with a significant number of students who drink compulsively on the weekend. The prevalence of smoking is significantly less than that of other students of the same age, while consumption of marihuana is similar and frequent. Consumption of tranquillizers was observed to be much higher compared to others of the same age group.

Emotional stress levels and the possible risk of suffering from psychopathological disorders are very high, especially in women.

Satisfaction levels with the academic setting are high on the whole, but express discontent with several aspects relating to the personalization of teaching and a lack of support on behalf of the authorities of the institutions.

The level of dissatisfaction with the academic setting is associated with greater levels of psychopathological risk factors and emotional exhaustion.

These data, which coincide with those from studies from other countries, justify the need to carry out programmes to promote healthy lifestyles, self-detection of emotional alterations and a lowering of academic stress. As has been stated in a recent study[64], "although it is not realistic to embark on a campaign to completely eliminate stress, it is reasonable to make an effort to find ways to reduce it and to help students deal with it."

8. Bibliography

1 Dyrbye LN, Thomas MR, Shanafelt TD. Systematic review of depression, anxiety, and other indicators of psychological distress among U.S. and Canadian medical students. Acad Med 2006, 81, 354-373.

2 Dyrbye LN, Thomas MR, Massie FS. et al. Burnout and suicidal ideation among U.S. medical students. Ann. Intern. Med. 2008, 149, 334-341.

3 Goebert D, Thompson D, Takeshita J. et al. Depressive symptoms in medical students and residents: a multischool study. Acad Med 2009, 84, 236-241.

4 Compton MT, Carrera J, Frank E. Stress and depressive symptoms/dysphoria among US medical students: results from a large, nationally representative survey. J. Nerv. Ment. Dis. 2008, 196, 891-897.

5 Guthrie EA, Black D, Shaw CM. et al. Embarking upon a medical career: psychological morbidity in first year medical students. 1995, Med Educ 29, 337-341.

6 Sender R, Salamero M, Vallés A, Valdés M. Psychological variables for identifying susceptibility to mental disorders in medical students at the University of Barcelona. Med Educ Online 2004, 9, 1-5.

7 Carson AJ, Dias S, Johnston A. et al. Mental health in medical students. A case control study using the 60 item General Health Questionnaire. Scott Med J 2000, 45, 115-116.

8 Moffat, KJ, McConnachie, A, Ross, S. et al. (2004). First year medical student stress and coping in a problem-based learning medical curriculum. Med Educ 38, 482-491.

9 Guthrie, E, Black, D, Bagalkote, H. et al. (1998). Psychological stress and burnout in medical students: a five-year prospective longitudinal study. J R Soc Med 91, 237-243.

10 Dahlin ME, Runeson B. Burnout and psychiatric morbidity among medical students entering clinical training: a three year prospective questionnaire and interview-based study. BMC Med Educ 2007, 7, 6.

11 Lomis, KD, Carpenter, RO. and Miller, BM. (2009). Moral distress in the third year of medical school; a descriptive review of student case reflections. Am. J. Surg. 197, 107-112.

12 Boland M, Fitzpatrick P, Scallan E et al. Trends in medical student use of tobacco, alcohol and drugs in an Irish university, 1973-2002. Drug Alcohol Depend 2006, 85, 123-128.

13 Tuttle JP, Scheurich NE, Ranseen J. Prevalence of ADHD diagnosis and nonmedical prescription stimulant use in medical students. Acad Psychiatry 2010, 34, 220-223.

14 Da Silveira DX, Rosa-Oliveira L, Di Pietro M. et al. Evolutional pattern of drug use by medical students. Addict Behav 2008, 33, 490-495.

15 Pickard M, Bates L, Dorian M. et al. Alcohol and drug use in second-year medical students at the University of Leeds. Med Educ 2000, 34, 148-150.

16 Haglund MEM, van Het Rot M, Cooper NS et al. Resilience in the third year of medical school: a prospective study of the associations between stressful events occurring during clinical rotations and student well-being. Acad Med 2009, 84, 258-268.

17 Nora LM, McLaughlin MA, Fosson SE. et al. Gender discrimination and sexual harassment in medical education: perspectives gained by a 14-school study. Acad Med 2002, 77, 1226-1234.

18 White, GE. (2000). Sexual harassment during medical training: the perceptions of medical students at a university medical school in Australia. Med Educ 34, 980-986.

19 Dyrbye LN, Thomas MR, Harper W et al. The learning environment and medical student burnout: a multicentre study. Med Educ 2009, 43, 274-282.

20 Baldassin S, Alves TC, de Andrade AG. et al. The characteristics of depressive symptoms in medical students during medical education and training: a cross-sectional study. 2008, BMC Med Educ 8, 60.

21 Dahlin M, Joneborg N, Runeson, B. Performance-based self-esteem and burnout in a cross-sectional study of medical students. Med Teach 2007, 29, 43-48.

22 Ross S, Cleland J, Macleod MJ. Stress, debt and undergraduate medical student performance. Med Educ 2006, 40, 584-589.

23 Dyrbye LN, Thomas MR, Huschka MM et al. A multicenter study of burnout, depression, and quality of life in minority and nonminority US medical students. Mayo Clin. Proc. 2006, 81, 1435-1442.

24 Sender, R, Vallés, A, Puig, O, Salamero, M. and Valdés, M. (2004). ¿Qué hay detrás del miedo a los exámenes? Educación Médica 7, 36-41.

25 Thomas, MR, Dyrbye, LN, Huntington, JL. et al. (2007). How do distress and well-being relate to medical student empathy? A multicenter study. J Gen Intern Med 22, 177-183.

26 Laidlaw A.H. Social anxiety in medical students: Implications for communication skills teaching. Med Teach 2009, 31, 649-654.

27 Dunn LB, Iglewicz A, Moutier, C. A conceptual model of medical student well-being: promoting resilience and preventing burnout. Acad Psychiatry 2008, 32, 44-53.

28 Departament de Salut de la Generalitat de Catalunya, Els catalans parlen de la seva salut. Barcelona: Direcció General de Planificació i Avaluació, 2009. Disponible en: http://www.gencat.cat/salut/depsalut/html/ca/plasalut/catparsesalut2006.pdf.

29 Rodríguez-Sanz M, Borrell C, Catedra J. Manual de l'Enquesta de Salut de Barcelona 2006. Barcelona, Agència de Salut Pública de Barcelona, 2008. Disponible en: http://www.aspb.es/quefem/docs/Manual%20Enquesta%20de%20Salut%202006.pdf.

30 Delegación del Gobierno para el Plan Nacional sobre Drogas. Observatorio Español sobre Drogas (OED). Informe 2007. Situación y tendencias de los problemas de drogas en España. Madrid: Ministerio de Sanidad y Consumo, 2008. Disponible en: http://www.pnsd.msc.es/Categoria2/publica/pdf/oed-2007.pdf.

31 Rodríguez-Martos A, Gual a, Llopis JJ. La unidad de bebida estándar: un registro simplificado del consumo de bebidas alcohólicas. Med Clin (Barc) 1999; vol.112, núm 12.

32 Craig CL, Marshall AL, Sjostrom M et al. International physical activity questionnaire: 12-country reliability and validity. Med Sci Sports Exerc 2003, 35, 1381-1395.

33 Goldberg, D. The General Health Questionnaire. Windsor, UK: NFER-Nelson, 1978.

34 Muñoz P, Vázquez J, Rodríguez F. Adaptación española del General Health Questionnaire (GHQ) de Goldberg. Arch Neurobiol 1979, 42, 139-158.

35 Blancafort, X, Masachs, E, Valero, S. et al. Estudi sobre la salut dels residents de Catalunya. Fundació Galatea, 2008.

36 Rohlfs, I, Arrizabalaga, P, Artazcoz, L. et al. Salut, estils de vida i condicions de treball dels metges i metgesses de Catalunya. Fundació Galatea, 2007.

37 Rammstedt B,John, O. Measuring personality in one minute or less: A 10-items short version of the Big Five Inventory in English and German. J Pers Res 2007, 41, 203-212.

38 Ozer DJ, Benet-Martinez V. (2006). Personality and the prediction of consequential outcomes. Annu Rev Psychol 2006, 57, 401-421.

39 Morey LC, Gunderson J, Quigley BD et al. Dimensions and categories: the "big five" factors and the DSM personality disorders. Assessment 2000, 7, 203-216.

40 Watson D, Clark LA, Chmielewski M. Structures of personality and their relevance to psychopathology: II. Further articulation of a comprehensive unified trait structure. J Pers 2008, 76, 1545-1586.

41 Rammstedt B, Goldberg LR, Borg I. The measurement equivalence of Big Five factor markers for persons with different levels of education. J Res Pers 2010, 44, 53–61.

42 Monroe SM. Modern approaches to conceptualizing and measuring human life stress. Annu Rev Clin Psychol 2008, 4, 33-52.

43 Cohen S, Tyrrell DA, Smith AP. Negative life events, perceived stress, negative affect, and susceptibility to the common cold. J Pers Soc Psychol 1993, 64, 131-140.

44 Midtgaard M, Ekeberg Ø, Vaglum P. et al. Mental health treatment needs for medical students: a national longitudinal study. Eur. Psychiatry 2008, 23, 505-511.

45 Maslach C, Jackson S, Leiter M. Maslach Burnout Inventory manual. 3th ed. Palo Alto, California: Consulting Psychologists Press, 1996.

46 Demerouti, E, Bakker, A.B, Vardakou, I. and Kantas, A. (2003). The convergent validity of two burnout instruments: A multitrait-multimethod analysis. Eur J Psychol Assess 19, 12-23.

47 Pompili M, Innamorati M, Narciso V et al. Bornout, hopelessness and suicide risk in medical doctors. Clin Ter 2010, 161, 511-4.

48 R Development Core Team. R: A Language and Environment for Statistical Computing. R Foundation for Statistical Computing, Vienna, Austria, 2011, http://www.R-project.org/.

49 Idler EL, Beyamini Y. (1997) Self-rated health and mortality: a review of twenty-seven community studies. J Health Soc Behav, 1997, 38, 21-37.

50 Dyrbye LN, Thomas MR, Shanafelt TD. Medical student distress: causes, consequences, and proposed solutions. Mayo Clin. Proc, 2005, 80, 1613-1622.

51 Roelen CA, Koopmans OC, de Graaf JH et al. Job demends, health perception ans sickness absence. Occup Med, 2007, 57, 499-504.

52 Frank E, Carrera JS, Elon L., Hertzberg VS. Basic demographics, health practices, and health status of U.S. medical students. Am J Prev Med, 2006, 31, 499-505.

53 West CP, Tan AD, Habermann TM, Sloan JA, Shanafelt TD. Association of resident fatigue and distress with perceived medical errors. JAMA, 2009 302, 1294-300.

54 Frank E, Tong E, Lobelo F, Carrera J, Duperly J. Physical activity levels and counseling practices of U.S. medical students. Med Sci Sports Exerc, 2008, 40, 413-21.

55 Liao Y, Knoesen NP, Castle DJ, et al.Symptoms of disordered eating, body shape, and mood concerns in male and female Chinese medical students. Compr Psychiatry, 2010, 51, 516-23.

56 Agència de Salut Pública de Barcelona, La salut a Barcelona, Barcelona 2006.

57 Voight K, Mittag D, Göbel A. Et al. Consumption of alcohol, cigarrettes and illegal substances among physicians and medical students in Brandenburg and Saxony. BMC Health Serv Res, 2009, 9, 219.

58 Bíró E, Balajti I, Adány R, Kósa k. Determinants of mental well-geing in medical students. Soc Psychiatr Epidemiol, 2010, 45, 253-258.

59 Ko, SM, Kua, EH, Fones CS. Stress and the undergraduates. Singapore Medical Journal, 1999, 40, 627-630.

60 Ghodasara SL, Davidson MA, Reich MS, et al. Assessing student mental health at the Vanderbilt University School of Medicine. Acad Med. 2011 86,116-21.

61 Firth-Cozens J. Medical student stress. Med Educ. 2001, 35, 6 –7.

62 Azuri J, Ackshota N, Vinker S. Reassuring the medical students' disease-health related anxiety among medical students. Med Teach. 2010, 32, 270-5.

63 Compton MT, Carrera J, Frank E. Stress and Depressive Symptoms/Dysphoria Among US Medical Students Results From a Large, Nationally Representative Survey. J Nerv Ment Dis. 2008, 196, 891–897.

64 Ghodasara SL, Davidson MA, Reich MS et al. Assessing student mental health at the Vanderbilt University School of Medicine. Acad Med. 2011 86, 116-21.

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Annex. Tables

Table 1: Medical Students Registered in the 4th Year in Schools in Catalonia

	Students registered in the 4th year		Students surveyed		Participation rate
University of Barcelona	240	29.8%	146	34.8%	**60.8%**
Autonomous University of Barcelona	350	43.5%	162	38.6%	**46.3%**
University Rovira i Virgili	100	12.4%	55	13.1%	**55.0%**
University of Lleida	115	14.3%	57	13.6%	**49.6%**
Total	805	100.0%	420	100.0%	**52.2%**

Table 2: Sociodemographic Characteristics of the Sample

	Total		Men		Women		p	n
Average age of students	**22.8** (2.12)		**22.7** (1.69)		**22.8** (2.25)		0.694	419
Students' place of birth							0.789	420
Catalonia	285	**67.9%**	73	**69.5%**	212	**67.3%**		
The rest of Spain	106	**25.2%**	24	**22.9%**	82	**26.0%**		
Outside Spain	29	**6.9%**	8	**7.6%**	21	**6.7%**		
Residence during studies							0.365	419
With one's family (with parents, partner or other family members)	226	**53.9%**	62	**59.0%**	164	**52.2%**		
In a shared apartment	174	**41.5%**	38	**36.2%**	136	**43.3%**		
In a student residence	6	**1.4%**	1	**1.0%**	5	**1.6%**		
In a rented room	3	**0.7%**	2	**1.9%**	1	**0.3%**		
In a studio	6	**1.4%**	1	**1.0%**	5	**1.6%**		
With other family members (grandparents, uncles/aunts, siblings)	2	**0.5%**	0	**0.0%**	2	**0.6%**		
Other	2	**0.5%**	1	**1.0%**	1	**0.3%**		
Father or mother is a physician	81	**19.3%**	23	**21.9%**	58	**18.4%**	0.520	420
Other family members are physicians	150	**35.7%**	37	**35.2%**	113	**35.9%**	1.000	420

Table 3: Academic Status

	Total		Men		Women		p	n
University Hospital							0.078	420
Hospital Joan XXIII	25	**6.0%**	4	**3.8%**	21	**6.7%**		
Hospital Sant Joan de Reus	30	**7.1%**	7	**6.7%**	23	**7.3%**		
Hospital Arnau de Vilanova	57	**13.6%**	12	**11.4%**	45	**14.3%**		
Hospital de Bellvitge	51	**12.1%**	16	**15.2%**	35	**11.1%**		
Hospital Germans Trias - Can Ruti	41	**9.8%**	13	**12.4%**	28	**8.9%**		
Hospital de Sabadell - Parc Taulí	20	**4.8%**	2	**1.9%**	18	**5.7%**		
Hospital Clínic	95	**22.6%**	22	**21.0%**	73	**23.2%**		
Hospital del Mar	25	**6.0%**	12	**11.4%**	13	**4.1%**		
Hospital de Sant Pau	34	**8.1%**	5	**4.8%**	29	**9.2%**		
Hospital Vall d'Hebron	42	**10.0%**	12	**11.4%**	30	**9.5%**		
University where they began their studies							0.260	419
In this same university	406	**96.9%**	100	**95.2%**	306	**97.5%**		
In another university of Catalonia	10	**2.4%**	5	**4.8%**	5	**1.6%**		
In another Spanish university	1	**0.2%**	0	**0.0%**	1	**0.3%**		
In another university outside Spain	2	**0.5%**	0	**0.0%**	2	**0.6%**		
Year began studies							0.837	418
Before 2005	20	**4.8%**	4	**3.8%**	16	**5.1%**		
2005	47	**11.2%**	14	**13.5%**	33	**10.5%**		
2006	349	**83.5%**	86	**82.7%**	263	**83.8%**		
After 2006	2	**0.5%**	0	**0.0%**	2	**0.6%**		
Have subjects pending from former courses	105	**25.0%**	27	**25.7%**	78	**24.8%**	0.948	420
Are studying subjects in higher level courses	58	**13.8%**	15	**14.3%**	43	**13.7%**	1.000	420

Table 4: Funding for Studies

	Total		Men		Women		p	n
Have a scholarship	70	**16.8%**	18	**17.3%**	52	**16.6%**	0.990	417
Finance their studies through loans	5	**1.2%**	2	**1.9%**	3	**1.0%**	0.602	417
Work and receive a salary	113	**26.9%**	35	**33.3%**	78	**24.8%**	0.112	420
Average work hours a week (students who work)	**10.9** (9,24)		**13.3** (9.92)		**9.9** (8.81)		0.102	110

Table 5: Self-Perceived Health Status and Health Care

	Total		Men		Women		p	n
Self-perceived health status							0.206	416
Excellent	64	**15.4%**	20	**19.2%**	44	**14.1%**		
Very good	186	**44.7%**	51	**49.0%**	135	**43.3%**		
Good	140	**33.7%**	29	**27.8%**	111	**35.6%**		
Average	26	**6.3%**	4	**3.8%**	22	**7.1%**		
Average number of hours of sleep	**6.92** (0.784)		**7.11** (0.841)		**6.86** (0.754)		0.012	419
Have a family doctor	246	**58.6%**	48	**45.7%**	198	**62.9%**	0.003	420
Have an open medical history	226	**92.6%**	44	**91.7%**	182	**92.9%**	0.761	244

Table 6: Self-perceived Health Status and Health Care. Comparative data of students 21 years or older in the general population (ESCA 2006). Percentage values

	4th year medical students			Students 21 years or older						
	Total	Men	Women	Total	Men	X^2 /t	p	Women	X^2 /t	p
Self-perceived Health Status						1.29	0.73		19.33	0.49
Excellent	15.4	19.2	14.1	13.2	16.3			9.4		
Very good	44.7	49.0	43.3	46.3	45.0			47.9		
Good	33.7	27.9	35.6	37.6	34.6			41.3		
Average	6.3	3.8	7.1	2.9	4.2			1.3		
Poor	0.0	0.0	0.0	0.0	0.0			0.0		
Average number of hours of sleep	**6.92**	**7.11**	**6.86**	**7.44**	**7.47**	4.1	<0.001	**7.40**	3.33	<0.001
n	416	104	312	236	130	--	--	106	--	--

Table 7: Physical Activity and Weight

	Total		Men		Women		p	n
Energy Index	**1,758** (2057)		**2,359** (2274)		**1,556** (1942)		p	n
Activity Level							<0.001	**408**
Intense physical activity	232	**56.9%**	77	**74.8%**	155	**50.8%**		
Light physical activity	85	**20.8%**	9	**8.7%**	76	**24.9%**		
Moderate physical activity	79	**19.4%**	14	**13.6%**	65	**21.3%**		
Sedentary	12	**2.9%**	3	**2.9%**	9	**3.0%**		
Body Mass Index							<0.001	**416**
Underweight (<18.5)	49	**11.8%**	5	**4.8%**	44	**14.1%**		
Normal weight (>=18.5 <25)	333	**80.0%**	78	**74.3%**	255	**82.0%**		
Overweight (>=25 <30)	31	**7.5%**	21	**20.0%**	10	**3.2%**		
Obese (>=30)	3	**0.7%**	1	**1.0%**	2	**0.6%**		

Table 8: Physical Activity and Weight. Comparative data with students 21 years or older in the general population (ESCA 2006). Percentage values

	4th year medical students			Students 21 years or older						
	Total	Men	Women	Total	Men	X^2 /t	p	Women	X^2 /t	p
Activity Level						2.11	0.55		6.54	0.09
Intense physical activity	56.9	74.8	50.8	51.2	63.0			36.7		
Light physical activity	20.8	8.7	24.9	25.7	21.6			30.7		
Moderate physical activity	19.4	13.6	21.3	19.6	14.1			26.4		
Sedentary	2.9	2.9	3.0	3.5	1.3			6.2		
Body Mass Index						0.97	0.62		48.93	<0.001
Underweight (<18.5)	11.8	4.8	14.1	6.9	2.3			12.5		
Normal weight (>=18.5 <25)	80.0	74.3	82.0	74.3	69.1			80.6		
Overweight (>=25 <30)	7.5	20.0	3.2	17.0	26.1			5.9		
Obesity (>=30)	0.7	1.0	0.6	1.8	2.5			1.0		

Table 9: Tobacco Consumption

	Total		Men		Women		p	n
Tobacco consumption							0.791	419
Daily smokers	49	**11.7%**	15	**14.3%**	34	**10.8%**		
Casual smokers	39	**9.3%**	9	**8.6%**	30	**9.6%**		
Ex-smokers	40	**9.6%**	6	**8.6%**	21	**9.9%**		
Non-smokers (have never smoked)	291	**69.5%**	75	**68.6%**	229	**69.7%**		
Age started smoking (smokers)	**16.7** (1.86)		**17.8** (2.15)		**16,3** (1.58)		0.005	87
Average number of cigarettes daily (current smokers)	**7.50** (6.06)		**8.05** (5.56)		**7.29** (6.27)		0.627	70
Number that have tried to quit smoking in the last 12 months (smokers)	25	**30.1%**	7	**29.2%**	18	**30.5%**	0.886	83
Months that have passed since quit smoking (Ex-smokers)	**39.4** (38.1)		**54.1** (32.7)		**35.1** (39.0)		0.189	36
Age started smoking (Ex-smokers)	**15.9** (2.39)		**16.3** (2.66)		**15.8** (2.38)		0.682	36

Table 10: Tobacco Consumption. Comparative data with students 21 years or older in the general population (ESCA 2006). Percentage values

	4th year medical students			Students 21 years or older						
	Total	Men	Women	Total	Men	X^2 /t	p	Women	X^2 /t	p
Tobacco consumption						6.56	0.087		27.29	<0.001
Daily smokers	11.7	14.3	10.8	25.2	21.7			29.5		
Casual smokers	9.3	8.6	9.6	10.8	9.4			12.4		
Ex-smokers	6.4	5.7	6.7	8.7	9.8			7.4		
Non-smokers (have never smoked)	72.6	71.4	72.9	55.3	59.1			50.7		

Table 11: Alcohol Consumption

	Total		Men		Women		p	n
Standardized Drinking Units	**13.8** (50.3)		**23.6** (63.3)		**10.8** (45.2)		0.080	375
Alcohol consumption							0.076	373
Non-drinkers	42	11.3%	12	13.3%	30	10.6%		
Moderate drinkers	251	67.3%	54	60.0%	197	69.6%		
At-risk drinkers	80	21.4%	24	26.7%	56	19.8%		
Frequency of having 5 or more drinks in one sitting							0.046	**419**
3 or 4 times a week	1	**0.2%**	1	**1.0%**	0	**0.0%**		
1 or 2 times a week	24	**5.7%**	10	**9.5%**	14	**4.5%**		
From 1 to 3 times a month	67	**16.0%**	18	**17.1%**	49	**15.6%**		
Less than once a month	151	**36.0%**	41	**39.0%**	110	**35.0%**		
Never	176	**42.0%**	35	**33.3%**	141	**44.9%**		

Table 12: Alcohol Consumption. Comparative data with students 21 years or older en general population (ESCA 2006). Percentage values

	4th year medical students			Students 21 years or older						
	Total	Men	Women	Total	Men	X^2 /t	p	Women	X^2 /t	p
Alcohol Consumption						16.24	<0.001		11.72	0.002
Non-drinkers	11.3	13.3	10.6	12.5	9.0			16.8		
Moderate drinkers	67.3	60.0	69.6	79.3	82.4			75.5		
At-risk drinkers	21.4	26.7	19.8	8.2	8.5			7.7		

Table 13: Use of Other Drugs at Any Time

	Total		Men		Women		p	n
Have taken tranquillizers or sleeping pills at any time	140	**33.5%**	20	**19.2%**	120	**38.2%**	0.001	418
Have used cannabis derivatives at any time	232	**55.5%**	55	**52.9%**	177	**56.4%**	0.613	418
Have used cocaine at any time	20	**4.8%**	7	**6.7%**	13	**4.1%**	0.293	418
Have used amphetamines at any time	11	**2.6%**	4	**3.8%**	7	**2.2%**	0.478	418
Have used heroin at any time	0	**0.0%**	0	**0.0%**	0	**0.0%**	…	418

Table 14: Use of Other Drugs at Any Time. Comparative data with students 21 years or older in the general population (ESCA 2006). Percentage values

	4th Year Medical Students			Students 21 years or older						
	Total	Men	Women	Total	Men	X^2 /t	p	Women	X^2 /t	p
Tranquillizers or sleeping pills at any time	33.5	19.2	38.2	10.7	7.1	1.75	0.040	15.1	4.05	<0.001
Cannabis derivatives at any time	55.5	52.9	56.4	48.9	48.3	0.09	0.930	49.7	0.45	0.656
Cocaine at any time	4.8	6.7	4.1	12.1	9.2	0.389	0.535	15.7	4.63	<0.001
Amphetamines at any time	2.6	3.8	2.2	*	*			*		
Heroine at any time	0.0	0.0	0.0	*	*			*		

*This intraining was not requested in the ESCA 2006

Table 15: Use of Other Drugs in the Last 30 Days (based on the student total and on students who have consumed at any given time)

		Total		Men		Women		p	n
Use of tranquillizers or sleeping pills in the last 30 days	Based on the total population	50	**12.0%**	7	**6.8%**	43	**13.7%**	0.863	418
	Based on the population that has used		**36.0%**		**36.8%**		**35.8%**		139
Use of cannabis derivatives in the last 30 days	Based on the total population	58	**14.0%**	19	**18.4%**	39	**12.5%**	0.084	418
	Based on the population that has used		**25.3%**		**35.2%**		**22.3%**		229
Cocaine use in the last 30 days	Based on the total population	1	**0.2%**	0	**0.0%**	1	**0.3%**	1.000	418
	Based on the population that has used		**5.0%**		**0.0%**		**7.7%**		20
Amphetamine use in the last 30 days		0	**0.0%**	0	**0.0%**	0	**0.0%**	…	0
Heroine use in the last 30 days		0	**0.0%**	0	**0.0%**	0	**0.0%**	…	0

Table 16: Consumption of Other Drugs in the Last 30 Days (over the total population). Comparative data among students of 21 years and older in the general population (ESCA 2006). Percentage values

	4th year medical students			Students 21 years or older						
	Total	Men	Women	Total	Men	X^2 /t	p	Women	X^2 /t	p
Tranquillizers or sleeping pills in the last 30 days	12.0	6.8	13.7	2.9	3.8	**	**	1.7	**	**
Cannabis derivatives in the last 30 days	14.0	18.4	12.5	20.9	21.2	**	**	20.6	**	**
Cocaine in the last 30 days	0.2	0.0	0.3	1.1	0.2	**	**	2.1	**	**
Amphetamines in the last 30 days	0.0	0.0	0.0	*	*			*		
Heroin at any time	0.0	0.0	0.0	*	*			*		

* This intraining was not requested in the ESCA 2006
** A statistical analysis was not carried out due to the low number of those affected

Table 17: Age When Began Using Other Drugs (average)

	Total	Men	Women	p	n
Age when began taking tranquillizers	**18.6** (2.8)	**19.3** (3.41)	**18.4** (2.69)	0.336	136
Age when began using cannabis derivatives	**16.3** (1.78)	**16.3** (1.89)	**16.4** (1.75)	0.705	231
Age when began using cocaine	**18.9** (3.2)	**19.4** (1.72)	**18.7** (3.82)	0.561	20
Age when began taking amphetamines	**19.2** (2.71)	**19.8** (1.26)	**18.9** (3.34)	0.544	11

Table 18: General Health Questionnaire (GHQ) and Personality Questionnaire

	Total		Men		Women		p	n
GHQ Score	3.1	3.04	2.43	2.85	3.32	3.08	0.008	417
GHQ mental health index							0.038	417
Probable normal mental health	222	**53.2%**	65	**62.5%**	157	**50.2%**		
Probable risk of poor mental health	195	**46.8%**	39	**37.5%**	156	**49.8%**		
BFI								
BFI Neuroticism	5.73	2.1	6.92	1.71	5.33	2.07	<0.001	420
BFI Extroversion	5.88	1.8	5.98	1.75	5.85	1.82	0.523	417

Table 19: General Health Questionnaire (GHQ). Comparative data with students 21 years or older in the general population (ESCA 2006). Percentage values

	4th year medical students			Students 21 years or older						
	Total	Men	Women	Total	Men	X^2 /t	p	Women	X^2 /t	p
GHQ Mental Health Index						30.59	<0.001		53.78	<0.001
Probable normal mental health	53.2	62.5	50.2	91.3	92.8			89.4		
Probable risk of poor mental health	46.8	37.5	49.8	8.7	7.2			10.6		

Table 20: Life Events

	Total		Men		Women		p	n
Number of adverse life events in the last year							0.137	
None	109	**26.0%**	28	**26.7%**	81	**25.7%**		420
One	97	**23.1%**	24	**22.9%**	73	**23.2%**		
Two	101	**24.0%**	29	**27.6%**	72	**22.9%**		
Three	52	**12.4%**	13	**12.4%**	39	**12.4%**		
More than three	61	**14.5%**	11	**10.5%**	50	**15.9%**		
Average number of life events	**1.75** (1.50)		**1.69** (1.55)		**1.77** (1.48)		0.662	415
Stress level attributable to life events							0.191	307
No or very little stress (score 1+2+3+4)	66	**21.5%**	21	**27.3%**	45	**19.6%**		
A bit of stress (5+6)	54	**17.6%**	16	**20.8%**	38	**16.5%**		
A great deal of stress (7+8)	131	**42.7%**	31	**40.3%**	100	**43.5%**		
A lot of stress (9+10)	56	**18.2%**	9	**11.7%**	47	**20.4%**		
Stress attributable to EV (median score out of 10)	**9.11** (16.7)		**7.05** (11.2)		**9.85** (18.3)		0.130	274

Table 21: Score for the Oldenburg Burnout Inventory (OLBI)

	Total	Men	Women	p	N
Exhaustion	2.26 (0.51)	2.49 (0.49)	2.18 (0.49)	<0.001	420
Lack of commitment	2.02 (0.42)	2.04 (0.44)	2.01 (0.42)	0.590	420

*The **emotional exhaustion** scale includes the following items: I always find new and interesting things in my studies; I speak negatively about my studies more and more; lately I tend to be less committed to my studies and I do them as a routine; I consider my studies to be a positive challenge; I can disconnect from my studies; I can't see myself doing another career than this one; I feel increasingly committed to my studies.*

*The **Lack of commitment** scale includes the following items: I tend to need more time to relax and feel better than before; I often feel mentally exhausted; When my day ends, I have enough energy for leisure activities; When my day ends, I usually feel tired; Some days I feel tired before starting classes; I have good resistance to the pressure of my studies; When I study, I often feel like my batteries are charged.*

Table 22: Satisfaction with the Educational Environment I

	Total		Men		Women		p	n
49.1. Satisfaction with the learning environment of the faculty							0.104	420
Very satisfied	135	**32.1%**	29	**27.6%**	106	**33.7%**		
A little satisfied	165	**39.3%**	43	**41.0%**	122	**38.7%**		
Neither satisfied nor unsatisfied	57	**13.6%**	16	**15.2%**	41	**13.0%**		
A little unsatisfied	53	**12.6%**	11	**10.5%**	42	**13.3%**		
Very unsatisfied	10	**2.4%**	6	**5.7%**	4	**1.3%**		
49.2. Education is a clear priority among professors							0.350	420
Totally agree	22	**5.2%**	6	**5.7%**	16	**5.1%**		
Agree	114	**27.1%**	32	**30.5%**	82	**26.0%**		
Neither agree nor disagree	160	**38.1%**	31	**29.5%**	129	**41.0%**		
Disagree	101	**24.0%**	29	**27.6%**	72	**22.9%**		
Totally disagree	23	**5.5%**	7	**6.7%**	16	**5.1%**		
49.3. The faculty promotes an environment of collaboration more than competition							0.160	419
Totally agree	52	**12.4%**	11	**10.5%**	41	**13.1%**		
Agree	111	**26.5%**	33	**31.4%**	78	**24.8%**		
Neither agree nor disagree	87	**20.8%**	15	**14.3%**	72	**22.9%**		
Disagree	122	**29.1%**	30	**28.6%**	92	**29.3%**		
Totally disagree	47	**11.2%**	16	**15.2%**	31	**9.9%**		
49.4. I am satisfied with the support I receive from my tutor							0.927	418
I don't have any tutors	234	**56.0%**	63	**60.0%**	171	**54.6%**		
Very satisfied	28	**6.7%**	6	**5.7%**	22	**7.0%**		
A little satisfied	32	**7.7%**	7	**6.7%**	25	**8.0%**		
Neither satisfied nor unsatisfied	81	**19.4%**	21	**20.0%**	60	**19.2%**		
A little unsatisfied	17	**4.1%**	3	**2.9%**	14	**4.5%**		
Very unsatisfied	26	**6.2%**	5	**4.8%**	21	**6.7%**		
49.5. I am satisfied with the support I receive from Student Services							0.197	410
Very satisfied	34	**8.3%**	7	**6.7%**	27	**8.8%**		
A little satisfied	54	**13.2%**	12	**11.5%**	42	**13.7%**		
Neither satisfied nor unsatisfied	226	**55.1%**	54	**51.9%**	172	**56.2%**		
A little unsatisfied	54	**13.2%**	14	**13.5%**	40	**13.1%**		
Very unsatisfied	42	**10.2%**	17	**16.3%**	25	**8.2%**		
49.6. I am satisfied with the support I receive from the Dean's office							0.775	415
Very satisfied	11	**2.7%**	3	**2.9%**	8	**2.6%**		
A little satisfied	35	**8.4%**	9	**8.7%**	26	**8.4%**		
Neither satisfied nor unsatisfied	237	**57.1%**	55	**52.9%**	182	**58.5%**		
A little unsatisfied	74	**17.8%**	19	**18.3%**	55	**17.7%**		
Very unsatisfied	58	**14.0%**	18	**17.3%**	40	**12.9%**		

Table 22: Satisfaction with the Educational Environment II

	Total		Men		Women		p	n
49.7. I am satisfied with the support I've received from professors							0.789	419
Very satisfied	62	**14.8%**	15	**14.3%**	47	**15.0%**		
A little satisfied	126	**30.1%**	31	**29.5%**	95	**30.3%**		
Neither satisfied nor unsatisfied	152	**36.3%**	42	**40.0%**	110	**35.0%**		
A little unsatisfied	59	**14.1%**	14	**13.3%**	45	**14.3%**		
Very unsatisfied	20	**4.8%**	3	**2.9%**	17	**5.4%**		
49.8. Professors supervising my internship have offered an adequate level of supervision							0.270	415
Totally agree	48	**11.6%**	7	**6.7%**	41	**13.2%**		
Agree	147	**35.4%**	35	**33.7%**	112	**36.0%**		
Neither agree nor disagree	108	**26.0%**	31	**29.8%**	77	**24.8%**		
Disagree	80	**19.3%**	20	**19.2%**	60	**19.3%**		
Totally disagree	32	**7.7%**	11	**10.6%**	21	**6.8%**		
49.9. One (or more) of the professors supervising my internship is not involved enough in my training							0.167	419
Totally agree	149	**35.6%**	46	**44.2%**	103	**32.7%**		
Agree	174	**41.5%**	41	**39.4%**	133	**42.2%**		
Neither agree nor disagree	46	**11.0%**	9	**8.7%**	37	**11.7%**		
Disagree	38	**9.1%**	5	**4.8%**	33	**10.5%**		
Totally disagree	12	**2.9%**	3	**2.9%**	9	**2.9%**		
49.10. Most of the rotations are organised to promote learning							0.225	419
Totally agree	23	**5.5%**	4	**3.8%**	19	**6.0%**		
Agree	152	**36.3%**	30	**28.8%**	122	**38.7%**		
Neither agree nor disagree	85	**20.3%**	27	**26.0%**	58	**18.4%**		
Disagree	129	**30.8%**	36	**34.6%**	93	**29.5%**		
Totally disagree	30	**7.2%**	7	**6.7%**	23	**7.3%**		
49.11. The variety of patients' medical problems is sufficient for my training							0.192	419
Totally agree	47	**11.2%**	15	**14.4%**	32	**10.2%**		
Agree	206	**49.2%**	45	**43.3%**	161	**51.1%**		
Neither agree nor disagree	87	**20.8%**	20	**19.2%**	67	**21.3%**		
Disagree	69	**16.5%**	19	**18.3%**	50	**15.9%**		
Totally disagree	10	**2.4%**	5	**4.8%**	5	**1.6%**		
49.12. I receive appropriate training feedback							0.610	417
Totally agree	19	**4.6%**	3	**2.9%**	16	**5.1%**		
Agree	168	**40.3%**	40	**38.5%**	128	**40.9%**		
Neither agree nor disagree	155	**37.2%**	39	**37.5%**	116	**37.1%**		
Disagree	59	**14.1%**	19	**18.3%**	40	**12.8%**		
Totally disagree	16	**3.8%**	3	**2.9%**	13	**4.2%**		

Table 22: Satisfaction with the Educational Environment III

	Total		Men		Women		p	n
49.13. Professors help identify areas that need additional training							0.048	419
Totally agree	13	**3.1%**	2	**1.9%**	11	**3.5%**		
Agree	92	**22.0%**	32	**30.8%**	60	**19.0%**		
Neither agree nor disagree	154	**36.8%**	34	**32.7%**	120	**38.1%**		
Disagree	113	**27.0%**	21	**20.2%**	92	**29.2%**		
Totally disagree	47	**11.2%**	15	**14.4%**	32	**10.2%**		

Table 23: Sexual Harassment and Racist Attitudes (affirmative responses)

	Total		Men		Women		p	n
Have received sexist comments	191	**45.5%**	48	**45.7%**	143	**45.4%**	0.955	420
Have received explicit and undesired sexual proposals	3	**0.7%**	0	**0.0%**	3	**1.0%**	0.576	420
Have suffered from undesired physical contact	11	**2.6%**	0	**0.0%**	11	**3.5%**	0.073	420
Have been offered academic advantages in exchange for sexual favours	0	**0.0%**	0	**0.0%**	0	**0.0%**	....	420
Have been a victim of racist comments or attitudes	110	**26.2%**	26	**24.8%**	84	**26.7%**	0.798	420

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Fundació GALATEA

Passeig de la Bonanova, 47
08017 Barcelona
Phone 93 567 88 56
Fax 93 567 88 54

fgalatea@fgalatea.org
www.fgalatea.org

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