Valley International Journals
Open Access Journal
International Journal Of Medical Science And Clinical Inventions
Volume 2 issue 09 2015 page no. 1353-1357 ISSN: 2348-991X
Available Online At: http://valleyinternational.net/index.php/our-jou/ijmsci

The Learning Of Human Physiology In Medical Students And Relation With Depressive Symptoms.

Urrutia-Aguilar María Esther1, Cocolotl González Daniela1, Ortíz-León Silvia2 ,Jaimes Medrano Aurora2,Guevara-Guzmán Rosalinda3

1Secretaría General, Facultad de Medicina, Universidad Nacional Autónoma de México.
2Departamento de Psiquiatría y Salud Mental, Facultad de Medicina, Universidad Nacional Autónoma de México,
3Departamento de Fisiología, Facultad de Medicina, Universidad Nacional Autónoma de México,

Abstract: *Medical students, throughout their academic life, are under many stressing factors; among which is the academic workload. Thus its impact in their achievement is becoming a big problem that must be analyzed. Medical physiology is the subject that describes the functioning of the human body and the one with the highest index of failing grades in the second year under the Curricula of the Faculty of Medicine at the Universidad Nacional Autónoma de México (UNAM). Objective: The aim of this paper was to analyze the impact of emotional aspects, before each Human Physiology departmental test, in the achievement of medical students. Methodology: Beck instrument was applied before exams´ period to all students who voluntarily participated and the grades gotten in each of the four departmental exams were analyzed. Descriptive and inferential statistics were carried out. Results: We found a significant relationship between some medical students had sleeping disorders and high levels of irritability in the second exam and this may cause grade gotten. Conclusion: Educational institutions must direct their efforts towards the materialization of programs for the prevention and effective handling of stress in students and include learning strategies that may allow them to, in one side, face academic life; and in the other, to avoid harmful and risky behaviors that interfere with the fulfillment of university studies.*

I. INTRODUCTION

Due to the medical career´s curricular load, it demands from its students, great devotion and dedication. Those who have studied the impact of stress, anxiety and depression in students report that these are factors that cause problems in their mental health1,2,3,4,5.

Some authors have reported that during the second year of medical school the levels of stress and anxiety are much more elevated than those of first year; maybe because this year is still within the period of adaptation for many students6,7,8,910.

The 2010 Medical Curriculum of the Faculty of Medicine at UNAM is dedicated to teach according to new trends in medical education to fit the changing situation of the health system and the society´s needs and expectations. During the first two years, the teaching of biomedical areas is emphasized: human physiology subject, whose objective in the formation of the future surgeon is to provide knowledge of the functions of the human organism, the acquisition of the necessary scientific methodology for its study and the development of attitudes towards health maintenance and the disease treatment. Aside from an inclusive macrostructure of the body, the function of the organs, the biochemistry and the pharmacological mechanisms, and consequently, the regular functioning as well as possible therapeutics11,12.

In a previous study we demonstrated that the complexity of contents cause a high level of depression in students, which directly affects their academic performance in physiology13.

UNAM´s medical students show a higher index of physiology failing in regards to other subjects. Given the importance in the formation of the future surgeon, the aim of this work was to learn

which of the items from the Beck instrument before departmental exams affects their grades.

II. METHOD

The Ethics and Research Committees of the Faculty of Medicine at UNAM approved the research protocol. The participants volunteered, signed an acceptance letter, and the results were used carefully guarding their confidentiality. The instruments were applied to second grade students taking Human Physiology and only those who completed their answers were considered.

The UNAM´s 2010 Medical Curriculum is a mixed program as areas and subjects are interacting to conform the curriculum with an orientation towards the development of competences. During the first two years, the teaching of the biomedical area is emphasized: Human Physiology is given in the second year with four hours of theory a week and four of practice during 32 weeks, with a total of 23 credits. The assessment is carried out through departmental exams (50%) and the professor´s criterion (50%).

The topics being dealt with are divided into thematic units. The first departmental exam assesses cellular physiology, neurophysiology and autonomic nervous system; the second, cardiovascular physiology; the third, respiratory and renal physiology; the fourth, endocrine system and digestive apparatus.

Questionnaire

Beck Depression Inventory (BDI). This is one of the most used instruments for the assessment of depressive symptoms in adolescents and adults14. It comprises 21 self applicable questions; every question includes a series of four asseverations from which one has to be chosen in regards to the way the patient has felt throughout the week. The total score varies from 0 to 63. A score higher or equal to 12 points was considered as a signaling cut to identify the cases with probable depression 15.

This instrument was applied to second grade medical students during the school year 2011-2012, a week before departmental exams and it was obtained the results per departmental exam of the items from the Beck with the highest significant differences per xi2 test inter the percentage of students who answered “not to have any problem” and the percentage of the ones who answered “from a mild to a severe symptomatology”.

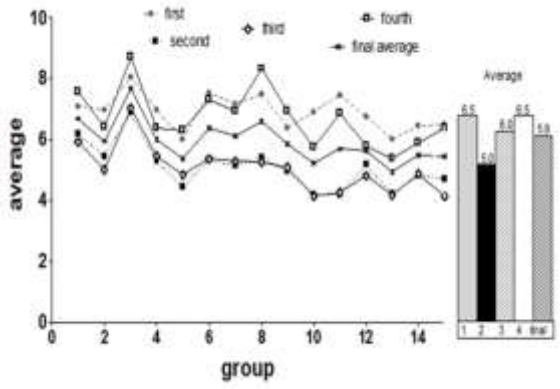
The percentage of right answers in the four departmental exams from August 2011 to May 2012 was considered. It is important to highlight that the departmental exams were applied at the same time to all populations and each contained 50 to 70 items chosen by a group of experts from an items bank (Cronbach > = 0.87 Y 0.92; level of difficulty = 30 y 70; positive discrimination = 70 y 90). The data were analyzed with the SPSS version 20. The statistical analysis was descriptive and inferential; they were conducted under the assumption of a type I error rate of 0.05.

III. RESULTS

The questionnaire that the students answered in each departmental exam varied because the day of its application only those who had attended out of 1,035 students in second grade answered it. In the first departmental exam, 54% took it; in the second 42%; in the third 46%; and in the fourth 38% of the total generation.

Graph 1 shows the results obtained by each group and the total average of each departmental exam. We can note the heterogeneity of the results in the exams between groups as well as in the second exam, where students obtained the lowest average; eight groups got a grade lower than five.

Graph 1. The grades obtained by each group and the total average per exam



Gray diamonds represent the first exam; black squares, the second; colorless diamond shapes, the third; colorless squares, the fourth; and the x represents the ones obtained as final average. In addition to this, the bars represent the general

average of all groups in each exam and the final one.
The table 1 shows the results per departmental exam of the items from the Beck with the highest significant differences.

The table I shows the percentage of students with some problem in the Beck inventory`s items for each exam that the xi2 test reported significant differences among the cases with depression and with no depression.

A. Table I. Percentage of students with symptoms of the item highlighted in each exam.

	EXAM			
Item	First %	Second %	Third %	Fourth %
Sadness	34	43	19	25
Self-image	35	47	19	29
Irritability	37	**58**	32	40
Insomnia	40	**50**	29	35
Libido loss	8	19	9	10

The number showed in the square represents the percentage of people who answered to have a problem.

IV. DISCUSSION

Our study determined that some medical students had sleeping disorders and also had high levels of irritability in the second exam which may have caused poor performance (Table 1). Several studies that use an interrupting sleep model have demonstrated that sleep affects the memory processing and retention16,17,18 probable cause of students poor academic performance in the second exam.

The sadness and self-image, were other psychological variables that were observed with low performance achievement. This point meets with the findings in different researches who reported psychological variables such as sadness, low self-esteem and motivation, all those that were associated with poor academic achievement. This should be considered in the academic training of university. 19,20

With respect to theorical considerations, when students do not exhibit high motivation they either do not initiate or discontinue learning tasks, and probably causes that their academic performance is not ideal. Specifically, the emotions like sadness can alter how information is stored and retrieved and also, memory can be changed depending on emotions experienced21. Finally, cognition, academic emotions, motivation and achievement goals have directional relationships between learning strategies and performance, all this impact the motivational and self- regulated learning components. In some cases, all these factors could explain the academic performance in medical students22.

Regularly, performance is considered as a unique criterion for success. And it is through grades and averages that medical students may get stimulus to study, or rather, have the possibility to register to programs of high performance or choose the group they would like to sign in, which may be affected by the high levels of irritability, sadness and self -image they face.

It is important to highlight that the academic performance rank as a final average was 4.6 to 7.7 (Graph 1) and that there were groups who obtained under 7 in each exam; some even (50%) under five in the second exam. Moreover, 50% of them obtained a final average under six. The latter shows the urgency to carry out a diagnosis of the program´s contents, as it shows that the objective to provide knowledge of the functions of the organism before the students entry to clinical venues is not being accomplished and that this may lead to bad medical diagnosis that they give during their training in the clinical area. The medical student must handle knowledge, concepts and basic principles (core curricula) integrated from medical basic sciences23, know when it is clinically important to focus in details, and use this data to back up the best medical decision for each individual patient. In addition to this, the General Medical Council “Tomorrow’s Doctors”, the Australian Medical Council la Association of American Medical Colleges (AAMC), and the National Commission for Academic Accreditation & Assessment, highlighted the importance of reducing the academic overload in the study curriculum24.

All findings may help teachers understand the activities and lifestyles of medical students to guide the way to improve academic achievements. Additionally, there is also a need to consider the changes in the teaching objectives that promote cooperative learning and actively participate in the professional development of medical students as an essential aspect of their role as educators of medical science25.

V. CONCLUSIONS

Educational institutions must direct their efforts towards the materialization of programs for the prevention and effective handling of stress in students. Part of the competences that they have to develop, include learning strategies that may allow them to, in one side, face academic life; and in the other, to avoid harmful and risky behaviors that interfere with the fulfillment of university studies11. In the particular case of students from the Faculty of Medicine, they require to develop personal competences to handle appropriately the levels of stress they are subjected to, as their practice in the last years involve social service and internship, which are highly demanding, as their profession itself.

Lastly, we consider that exams carried out must be assessed not only by contents but also consider the assessment of procedure and behavioral contents, that may provide a true formative assessment. A limitation of this study is that departmental exams are mainly structured to assess declarative contents.

Acknowledgements
The authors thank Josefina Bolado for the review of style and translation into English language.

REFERENCES

[1] Omigbodun OO, Odukogbe AT, Omigbodun AO, Yusuf OB, Bella TT, Olayemi O. Stressors and psychological symptoms in students of medicine and allied health professions in Nigeria. Soc Psychiat Psychiat Epidemiol. 2006;41(5): 415–421.

[2] Fouilloux C, Barragan V, Ortiz S, Jaimes A, Urrutia E, Guevara-Guzmán R. Síntomas depresivos y rendimiento académico en estudiantes de medicina. Salud Ment. 2013;36:59-65.

[3] Smith CK, Peterson DF, Degenhardt BF, Johnson JC. Depression, anxiety, and perceived hassles among entering medical students. Psychol Health Med.2007;12(1): 31–39.

[4] Urrutia-Aguilar ME, Ortiz LS, Fouilloux MC, Ponce RR, Guevara-Guzmán R. El rendimiento académico en el primer año de la carrera de médico cirujano: Modelo multivariado explicativo. Gac Med Mex. 2014;150 (S 3): 324-330.

[5] Vaidya PM, Mulgaonkar KP. Prevalence of depression, anxiety and stress in undergraduate medical students and its correlation with their academic performance. Indian J Occup Ther. 2007;39 (1): 7-10.

[6] Essau CA, Lewinsohn PM, Seeley JR, Sasagawa S. Gender differences in the developmental course of depression. J Affect Disord. 2010;127:185–190.

[7] Liselotte N, Dyrbye MD, Matthew R, Thomas MD. Systematic review of depression, anxiety, and other indicators of psychological distress among U.S. and Canadian medical students. Acad Med. 2006;81(4): 354-373.

[8] Mikolajczyk RT, Maxwell AE, El Ansari W. Prevalence of depressive symptoms in university students from Germany, Denmark, Poland and Bulgaria. Soc Psychiat Epidemiol. 2008;43:105–112.

[9] Sherry S, Notman MT, Nadelson CC, Kanter F. Anxiety, depression, and menstrual symptoms among freshman medical students. J Clin Psychiat.1988; 49:490-493.

[10] Stewart SM, Lam TH, Betson CL, Wong CM, Wong AM. A prospective analysis of stress and academic performance in the first two years of medical school. Med Educ Ox. 1999;33(4): 243-250.

[11] Campbell EJM. Basic science, science, and medical education. The Lancet. 1976;370:134–6.

[12] Sweeney G. The state of play in 1999: closing remarks. Clin Invest Med. 2000;23:37–8.

[13] Guevara-Guzmán and Urrutia-Aguilar ME. Curricular content level of complexity is a factor of depression and learning in medical

students. Journal of behavioral and brain science. 2015;5: 274-279.

[14] Beck AT, Steer RA, Garbin MC. Psychometric properties of the Beck Depression Inventory. Twenty five years of evaluation. Clin Psychol Rev.1988; 8:77-100.

[15] Torres-Castillo M, Hernández E, Ortega H. Validez y reproducibilidad del inventario para Depresión de Beck, en un hospital de cardiología. Sal Ment. 1991;14(2):1-6.

[16] Fishbein W. Disruptive effects of rapid eye movement sleep deprivation on long-term memory. Physiol Behav. 1971;6: 279–282.

[17] Kongsomboon K. Academic achievement correlated to stress, depression, and sleep deprivation in medical students. Srinagarind Med J. 2010;25: 109–114.

[18] Landrigan CP, Rothschild JM, Cronin JW, Kaushal R, Burdick E, Katz JT, Lilly CM, Stone PH, Lockley SW, Bates DW, Czeisler CA. Effect of reducing interns work hours on serious medical errors in intensive care units. N Engl J Med.2004;351: 1838–1848.

[19] Hamaideh, S. H., & Hamdan-Mansour, A. M.. Psychological, cognitive, and personal variables that predict college academic achievement among health sciences students. Nurse education today2014;. 34(5):703-708.

[20] Saadat, M., Ghasemzadeh, A., Soleimani, M. Self-esteem in Iranian university students and its relationship with academic achievement. Procedia Soc. Behav. Sci. 2012;31:10–14.

[21] Kim, C., Pekrun, R. Emotions and motivation in learning and performance. In Handbook of research on educational communications and technology. Springer New York. 2014; 65-75.

[22] Ranellucci, J., Hall, N. C., Goetz, T. Achievement Goals, Emotions, Learning, and Performance: A Process Model. Motivation Science. 2015; 1-23.

[23] Rodríguez R, Vidrio H, Campos-Sepúlveda E. Medicalization of pharmacology teaching: an urgent need in the medical curriculum. Proc West Pharmacol Soc. 2009;52: 120-28.

[24] Geffen L. Assuring medical standards: the Australian Medical Council 1985– 2010. Med J Aust. 2010;193:3-4.

[25] Chantacha S, Sorachai S, Sawita K, Sarawut S. Exploratory study of factors related to educational scores of first preclinical year medical students. Adv Physiol Educ (March 1, 2014). doi: 10.1152/advan.00162.2012.