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Original Research

Impact and Amount of Academic Self-efficacy and Stress on the Mental and Physical Well-Being of Students Competing in the 4th Olympiad of Iranian Universities of Medical Sciences

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Abstract

Introduction: Studying mental and physical health and their determinants is an important issue, especially among future health providers.

Methods: This is a sectional-analytical study whose target population was students who had participated in the 4th National Olympiad of Medical Sciences Universities in Tabriz, Iran, held in February 4-7 2013.Web-based designed questionnaires were sent to all 328 participating students' emails containing our questionnaires that were designed as web-based through Google Drive was sent to all available email addresses of our target population. Questionnaires consisted of student life stress inventory (SLSI), SF-36 (Short Form Health Survey), and College Self-Efficacy Inventory (CSEI), which were translated to Persian and revalidated. The data were analyzed using SPSS ver.19 software.

Results: 59 students completely filled the questionnaires and enrolled in the study. In the area of student life stress inventory, the total score of the participants ranged from 79(13.73%) to 168(63.73%) with a mean of 130.74(40.05%) and SD of 21.51(10.84%). On the college self-efficacy scale, participants' scores ranged from 62(40.79%) to 152(100%) with a mean of 114.29(77.10%) and SD of 22.82(14.20%). On the Sf-36 form, participants scored 72.28±14.09% on average (Min=44.03%, Max=98.75%). The Spearman correlation coefficient test indicated that all correlations between variables were statistically significant ($p<0.001$).

Conclusion: It can be concluded that adopting additional methods to increase self-efficacy and decrease stress amongst medical students in the academic population will lead to improved mental and physical health, which can help national improvement of science.

Introduction

Mental and physical health and their determinants are vital issues in the general population that should be thoroughly investigated; however, even more attention is demanded when taking medical sciences students into consideration, as they will become members of the future health-providing team of society. The World Health Organization (WHO) defined health in its broader sense in 1946 as "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity".[1-2] Mental health is a central determinant of quality of life,[3] and a healthy mind may promote physical well-being itself.[4]

Self-efficacy is defined as the belief in one's own ability to accomplish tasks and reach goals, and it affects every area of human endeavor.[5] Academic self-efficacy refers to individuals' convictions that they can successfully perform given academic tasks at designated levels[6] and it may be influenced by differences in personality, motivation, and the task itself.[7] Self-efficacy is closely related to acting properly in the educational field and doing tasks by the students (i.e. people who believe that they can perform well on a task), will act better than those who don't,[7] and educational success can have a positive effect on mental and physical well-being.[8]

Stress is the result of an individuals' perception that a situation seems overwhelming without having enough resources to cope. Stress can have both positive and negative consequences on individual's physical and psychological well-being if not adequately managed.[9-10] In psychology, stress is a feeling of strain and pressure.[11] Medical students are more frequent victims of academic

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stress than non-medical students.[12] Previous studies revealed high perception of stress in medical science students[13;- 14] there are also some Iranian studies emphasizing this problem.[15-16] Thus, identifying stressors and reactions of students to stressors is considered of great importance. Stress has a negative influence on mental health[17] and the same negative effect on physical health by reducing the amount of nocturnal sleep, using sedative drugs, suppressing the immune system and neurohormonal changes.[8,18] Above all, the coping abilities and effects of stress and self-efficacy on mental and physical health greatly vary between individuals depending on their behavioral differences and personality traits,[7,19] which shows the great importance of studying these factors in different populations.

The aim of this study was to determine the amount and impact of academic self-efficacy and stress on the mental and physical health of students participating in the 4th National Olympiad of Medical Sciences held in Tabriz, Iran in 2013 which was based on four principal fields: 1) Scientific thinking on basic sciences; 2) Management of the health care system; 3) Clinical deduction; and 4) innovative thinking and behavioral science. The students competing in this Olympiad were selected through exams at their local universities.

Determining these studied variables (i.e. stress, self-efficacy, and health) in such a population as these top students can prompt designation of programs to improve their well being, and in so doing, cause an overall national improvement of science and health.

Materials and Methods

Study population and Data collection

The target population was defined as students registered in 4thNational Medical Sciences Olympiad in Tabriz, Iran, which was held in February 4-7, 2013.Emails containing our questionnaires that were designed as web-based through Google Drive was sent to all available email addresses of our target population. We had acquired access to the students' emails with the permission from the Education Development Center of Tabriz University of Medical Sciences. After waiting for two months from the beginning of data collection in March 2013 and getting some replies, questionnaires were sent once again and the target population was also called by phone, and then was asked to reply. Data collection was stopped after another interval of one month in June 2013.

It was defined in our emails to the students that their information would be kept secret even from the data analyzers who were blinded and couldn't know the identity of the respondents (from their email addresses), however, in order to be able to determine all the questionnaires that each individual filled, for performing correlation tests, we had included one key question (Birth Date) in the beginning of all three questionnaires.

Questionnaires consisted of student life stress inventory (SLSI) , SF-36 (Short Form Health Survey), and College self-Efficacy Inventory (CSEI) in their validated Persian translations.

Descriptive statistical tests for each questionnaire's data and also correlation tests between questionnaires were performed by SPSS.19 software.

Assessment tools

SF-36 (Short Form Health Survey)

SF-36 is approved as an appropriate tool for assessing health-related quality of life in the general Population,[20-21] and its reliability and validity were confirmed using internal consistency, known group's comparison and convergent validity.[22] We chose this questionnaire to assess the mental and physical well being of the students. Each question was scored from 0 to 100, where higher scores indicate better health conditions (besides existence of a few negative questions which were analyzed in a reciprocal manner), then averaged to provide a final score in eight subscales as described below.

- Physical Component Summary (PCS)
  - a) Physical function Q: 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
  - b) Role limitation of physical function Q: 13, 14, 15, 16
  - c) Pain Q:21, 22
  - d) General health perception Q:1, 33, 34, 35, 36
- Mental Component Summary (MCS)
  - a) Role limitation of emotional function Q: 17, 18, 19
  - b) Emotional function Q:24, 25, 26, 28, 30
  - c) Vitality Q:23, 27, 29, 31
  - d) Social functions Q:20, 32

A single, unscaled item (Q2) measures changes in the respondents' health over the past year.

Student life stress inventory (SLSI)

The Student-Life Stress Inventory onsists of 51 items listed in 9 sections indicating different types of stressors (frustrations, conflicts, pressures, changes, and self-imposed stressors) and reactions to the stressors (physiological, emotional, behavioral, and cognitive) as perceived by university students. One question at the beginning of the questionnaire asks the participants to rate their overall stress level (Mild, Moderate, or Severe). Scores were calculated for each item on a Likert scale of 0 to 4 appointed respectively to each of the following choices: Never, Seldom, Occasionally, Often, and Most of the time. Previous studies surveyed the concurrent validity of SLSI by confirmatory factor analyses and the analysis of variance[23-24] and reliability obit by Pearson product-moment correlations and internal consistency.[24-25] Results of local studies considered SLSI a valid and reliable scale in undergraduate students for determining college students' stressors, reactions to stressors and their overall stress index.[26-27]

College Self-Efficacy Inventory (CSEI)

This 20-item instrument is composed of three main

subscales: course efficacy (e.g., writing papers, doing well on exams), social efficacy (e.g., talking with professors, making friends at the university), and roommate efficacy (e.g., socializing with roommates, dividing apartment space). Scores were calculated on a Likert scale of 0 to 8, ranging from "totally unconfident" to "totally confident". The subscales demonstrated strong internal consistency[28-29] and represented good convergent and discriminate validity.[28] The data were analyzed using SPSS ver.19 software. The Spearman correlation coefficient test indicated all correlations between variables were statistically significant ($p<0.001$).

Results

Of a total of 438 students who had participated in the Olympiad, we had access to the email addresses of 328 students and from these, 49students' emails were invalid or deactivated, leaving behind the successful delivery of our emails to 279 students. Eventually 59 students filled out the three questionnaires.

Table 1 demonstrated the mean scores extracted from each questionnaire.

Student life stress inventory: the participants scores ranged from 79(13.73%) to 168(63.73%) with a mean of 130.74(40.05%) and an SD of 21.51(10.84%).Also, 27.1% reported having mild stress, 50.9% reported having moderate stress and 22.0 % reported having severe stress.

College self-efficacy scale: the participants scores ranged from 62 (40.79%) to152 (100%) with a mean of 114.29(77.10%) and an SD of 22.82(14.20 %).

SF-36 form: Participants scored 72.28±14.09% on average (min=44.03%, max=98.75%). 52% of students reported no change in their health over the past year. The mean score for Mental Component Summary (MCS) was 61.51% and the mean score for Physical Component Summary (PCS) was 77.73%.

Further information extracted from each subscale of questionnaires is depicted in Table 2.

Scatter plots was drawn for determining the impact of self-efficacy and stress on health, shown respectively in Figures 1 and 2.

As shown in Table 3, the Spearman test indicated that all correlations between variables were statistically significant ($p<0.001$). The Spearman correlation between health and stress was -0.584 (inversely correlated), the score between health and self-efficacy was 0.585, and between stress and self-efficacy was -0.473, where the Spearman correlation could vary from -1 to +1 (the closer to 0 it got, the deviation for error became larger, and the closer to +1 or -1, the less likely the deviation for error).

Discussion

As shown in Table 1, the mean stress score extracted from the Student Life Stress Inventory was moderately high (40.05±SD=10.84%); also 72.9% of students themselves reported moderate to severe overall stress levels, whereas self-efficacy and health scores extracted from College Self-Efficacy Inventory and SF-36 form were about 75±14%, which although not ideal, were acceptable.

It was demonstrated that students have moderately high levels of self-efficacy (about 6 of 8) in all three subscales of the self-efficacy questionnaire (Course, Social, and Roommate efficacy).The results of a meta-analysis indicated self-efficacy as one of the best predictors of academic achievement and performance.[30] Characteristics of the target population (composed of talented students who succeeded in participating in this Olympiad) could be a possible rationale for good scores of self-efficacy.

In a more detailed analysis of subscales (Table 2), we could observe that in the stress questionnaire, most students scored higher on "Pressures and Self-imposed stressors" sections as their main sources of stress. Also, it was observed that students' reactions to stressors were mostly of cognitive and emotional type rather than behavioral or physiological reactions both emotional and physical reactions to pressure and stressors could cause mental and physical symptoms, which could threatens well-being.[31] (Figure 2)

According to the SF-36 questionnaire, individuals had higher scores of PCS, an indicator of physical health, compared to MCS, an indicator of mental health (77.73 vs. 61.51). The lowest scoring item was "limitations in usual role activities because of emotional problems" (48.63%). Considering this finding and results from the stress questionnaire about cognitive and emotional reactions to stressors, it can be concluded that medical science students might be vulnerable to emotional disorders comprised of anxiety and depression. Other studies reported a high prevalence of depression and anxiety and other emotional disturbances among medical sciences students, which support our findings.[32-33] The highest scoring item was "physical function" which indicated overall good physical health in students, while the other items scored moderate to good.

As depicted by scatter plots in Figures 1 and 2 and also the correlation results in Table 3, it was perceived that an increase in self-efficacy and also a decrease in stress levels would enhance the mental and physical health of the students. Also, an inverse correlation was found between stress and self-efficacy, previous studies confirming this result.[34-35] A student's concept of excellence and higher levels of self-efficacy is an obvious contributor to his/her performance and academic educational achievements; this reduces academic stress, which can have positive effects on mental and physical well-being.[8]

According to the results and the certain relationship between self-efficacy, stress, and health, it is necessary to adopt special practical methods in order to increase self-efficacy and decrease stress even more in the young and exuberant academic population, which will lead to mental and physical health improvement and the subsequent national improvement of science. This study has several Limitations. Regarding the total population size intended for study, the sample size that answered the questionnaires (59) was small—the research team expected at least twice this number. This lack of sufficient answers from the students might limit the reliability of the results of this

Table 1. Mean scores relating to each questionnaire

Questionnaire	Score	
	Numeric	Percentile*
SLSI	130.74±21.51 (79 to 168)	40.05±10.84 (13.73 to 63.73)
CSEI	114.29±22.82 (62 to 152)	77.10±14.20 (40.79 to 100)
SF-36**		72.28±14.09 (44.03 to 98.75)

*The data are also presented in a percentile form for facilitation of comparison of scores in each questionnaire.
**As SF-36 form's data were calculated in a scale of 0-100, the data are already in a percentile form.

Table 2. Data extracted from each subscale of each questionnaire

Questionnaire		Subscale	Mean*
SLSI	Stressors	Frustrations	1.58±0.58
		Conflicts	1.63±0.65
		Pressures	2.25±0.74
		Changes	1.80±0.64
		Self-imposed Stressors	2.43±0.64
	Reaction to Stressors	Physiological	0.96±0.57
		Emotional	1.64±0.66
		Behavioral	1.19±0.63
		Cognitive	1.99±0.65
	CSEI	Course Efficacy	6.11±1.20
		Social Efficacy	6.05±1.40
		Roommate Efficacy	5.76±1.40
SF-36	Physical component summary (PCS)	Physical function	88.45±12.58
		Role limitation of physical function	77.04±31.38
		Pain	76.07±20.01
		General health perception	69.08±19.46
	Mental component summary (MCS)	Social functions	73.82±19.22
		Role limitation of emotional function	48.63±42.46
		Vitality	61.36±20.77
		Emotional function	63.61±20.10

*Score range for SLSI is between 0 to 4 and for CSEI is between 0 to 8 and for SF-36 is between 0 to 100

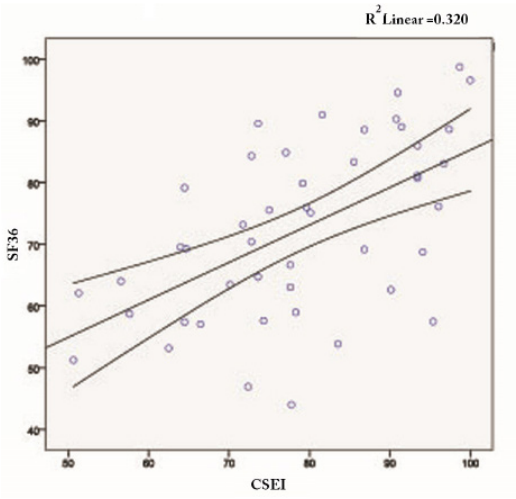

Figure 1. Scatter plot diagram indicating the correlation between health and self-efficacy

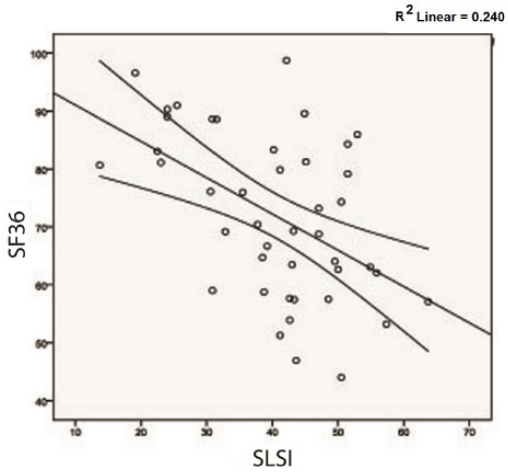

Figure 2. Scatter plot diagram indicating the correlation between health and stress

Table 3. Correlations between questionnaires' data

	SF-36	SLSI	CSEI
SF-36	1	-0.584*	0.585*
SLSI	-	1	-0.473*
CSEI	-	-	1

*Correlations are significant at the 0.01 level

paper. It is recommended that further studies with larger sample sizes (perhaps by using a mandatory method that would require the students to answer the questionnaires) be conducted in the future for more reliable results.

Competing interests

There are no conflicts to report for this study.

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References

1. Richardson M, Abraham C, Bond R. Psychological correlates of university students' academic performance: a systematic review and meta-analysis. Psychol Bull 2012;138(2):353-387.
2. Constitution of the World Health Organization. 1946. Bull World Health Org 2002;80(12):983-984.
3. Bovier PA, Chamot E, Perneger TV. Perceived stress, internal resources, and social support as determinants of mental health among young adults. Qual Life Res 2004;13(1):161-170.
4. Salovey P, Rothman AJ, Detweiler JB, Steward WT. Emotional states and physical health. Am Psychol. 2000;55(1):110-121.
5. Ormrod J. Educational psychology: Developing learners. 5th ed. Upper Saddle River, N.J.: Pearson/Merrill Prentice Hall.; 2006.
6. Ferla J, Valcke M, Cai Y. Academic self-efficacy and academic self-concept: Reconsidering structural relationships. Learn Individ Differ 2009;19(4):499-505.
7. Gist ME, Mitchell TR. Self-efficacy: A theoretical analysis of its determinants and malleability. Acad Manage Rev 1992;17(2):183-211.
8. Fooladvand KhFV, Shahraray M, Sangari AA. [Role of social support, academic stress, and academic self-efficacy on mental and physical health]. Contemporary Psycholology 2010;4(2):81-93.
9. Agolla JE, Ongori H. An assessment of academic stress among undergraduate students: The case of University of Botswana. Educational Research and Reviews 2009;4(2):63-70.
10. Atkinson JM, Millar K, Kay EJ, Blinkhorn AS. Stress in dental practice. Dent update 1991;18(2):60-64.
11. Cohen S, Janicki-Deverts D, Miller GE. Psychological stress and disease. JAMA 2007;298(14):1685-1687.
12. Al-Dabal BK, Koura MR, Rasheed P, Al-Sowielem L, Makki SM. A Comparative Study of Perceived Stress among Female Medical and Non-Medical University Students in Dammam, Saudi Arabia. Sultan Qaboos Univ Med J 2010;10(2):231-240.
13. Elzubeir MA, Elzubeir KE, Magzoub ME. Stress and coping strategies among Arab medical students: towards a research agenda. Educ Health (Abingdon) 2010;23(1):355.
14. Reeve KL, Shumaker CJ, Yearwood EL, Crowell NA, Riley JB. Perceived stress and social support in undergraduate nursing students' educational experiences. Nurse Educ today 2013;33(4):419-424.
15. Sharifirad G, Marjani A, Abdolrahman C, Mostafa Q, Hossein S. Stress among Isfahan medical sciences students. J Res Med Sci 2012;17(4):402-406.
16. Marjani A, Gharavi AM, Jahanshahi M, Vahidirad A, Alizadeh F. Stress among medical students of Gorgan (South East of Caspian Sea), Iran. Kathmandu University Medical Journal 2008;6(3):421-425.
17. Sherbourne CD. The role of social support and life stress events in use of mental health services. Soc Sci Med 1988;27(12):1393-1400.
18. Al-Ayadhi LY. Neurohormonal changes in medical students during academic stress. Ann Saudi Med 2005;25(1):36-40.
19. Rivera-Torres P, Araque-Padilla RA, Montero-Simó MJ.

Job Stress Across Gender: The Importance of Emotional and Intellectual Demands and Social Support in Women. Int J Environ Res Public Health 2013;10(1):375-389.
20. Brazier JE, Harper R, Jones NM, O'Cathain A, Thomas KJ, Usherwood T, Westlake L. Validating the SF-36 health survey questionnaire: new outcome measure for primary care. BMJ 1992;305(6846):160-164.
21. Garratt AM, Ruta DA, Abdalla MI, Buckingham JK, Russell IT. The SF36 health survey questionnaire: an outcome measure suitable for routine use within the NHS? BMJ 1993;306(6890):1440-1444.
22. Montazeri A, Goshtasebi A, Vahdaninia M, Gandek B. The Short Form Health Survey (SF-36): translation and validation study of the Iranian version. Qual Life Res 2005;14(3):875-882.
23. Gadzella BM. Student-Life Stress Inventory: identification of and reactions to stressors. Psychol Rep 1994;74(2):395-402.
24. Gadzella B, Baloglu M. Confirmatory factor analysis and internal consistency of the Student-life Stress Inventory. Journal of Instructional Psychology 2001;28(2):84-94.
25. Gadzella BM, Ginther DW, Fullwood HL. Patterns of relationships among types of stressors. Paper presented at the Southwestern Psychological Association Convention, Corpus Christi TX. 1993.
26. Shokri O, Farahani MN, Valiolah F, Safaei P, Sangari AA, Daneshvar Amerri Z. Factorial validity and reliability of farsi version of the student-life stress inventory. Research in Psychological Health 2008;2(1):17-27.
27. Bakhshipour ABM, Alilou MM, Hashemi T, Esmailpour Kh. [Evaluation of the psychometric properties of the Student Life Stress Inventory (SLSI) among Tabriz University students]. Tabriz: Tabriz University;2009.
28. Solberg VS, O'Brien K, Villareal P, Kennel R, Davis B. Self-efficacy and Hispanic college students: Validation of the college self-efficacy instrument. Hisp J Behav Sci 1993;15(1):80-95.
29. Tilley B. The Revised Version of the Educational Outcome Expectancy Scale. Journal of Research in Innovative Teaching 2008;1(1):220-235.
30. Ekpenyong CE, Daniel NE, Aribo EO. Associations between academic stressors, reaction to stress, coping strategies and musculoskeletal disorders among college students. Ethiop J Health Sci 2013;23(2):98-112.
31. Jadoon NA, Yaqoob R, Raza A, Shehzad MA, Zeshan SC. Anxiety and depression among medical students: a cross-sectional study. J Pak Med Assoc 2010;60(8):699-702.
32. 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(4):354-373.
33. Prinz P1, Hertrich K, Hirschfelder U, de Zwaan M. Burnout, depression and depersonalisation--psychological factors and coping strategies in dental and medical students. GMS Z Med Ausbild 2012;29(1):Doc10.
34. Torres JB, Solberg VS. Role of Self-Efficacy, Stress, Social Integration, and Family Support in Latino College Student Persistence and Health. J Vocat Behav 2001;59(1):53-63.
35. Zajacova A, Lynch SM, Espenshade TJ. Self-Efficacy, Stress, and Academic Success in College. Res High Educ 2005;46(6):677-706.