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”. Mental health is a central determinant of quality of life, and a healthy mind may promote physical well-being itself. 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. Academic self-efficacy refers to individuals’ convictions that they can successfully perform given academic tasks at designated levels and it may be influenced by differences in personality, motivation, and the task itself. 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, and educational success can have a positive effect on mental and physical well-being.

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. Stress is a feeling of strain and pressure.

Medical students are more frequent victims of academic...
stress than non-medical students. Previous studies revealed high perception of stress in medical science students there are also some Iranian studies emphasizing this problem. Thus, identifying stressors and reactions of students to stressors is considered of great importance. Stress has a negative influence on mental health 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. 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, 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 the 4th National 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, and its reliability and validity were confirmed using internal consistency, known group’s comparison and convergent validity. 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 consists 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 and reliability obit by Pearson product-moment correlations and internal consistency. 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.

**College Self-Efficacy Inventory (CSEI)**

This 20-item instrument is composed of three main...
subscapes: 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 and represented good convergent and discriminate validity. 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, 49 students’ 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%) to 152 (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.

As depicted by scatter plots in Figures 1 and 2 and also the correlation results in Table 3, it was believed that a decrease 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. 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. 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.

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. 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.

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 study.
Table 1. Mean scores relating to each questionnaire

<table>
<thead>
<tr>
<th>Questionnaire</th>
<th>Score</th>
<th>Percentile*</th>
</tr>
</thead>
<tbody>
<tr>
<td>SLSI</td>
<td>130.74±21.51</td>
<td>40.05±10.84</td>
</tr>
<tr>
<td></td>
<td>(79 to 168)</td>
<td>(13.73 to 63.73)</td>
</tr>
<tr>
<td>CSEI</td>
<td>114.29±22.82</td>
<td>77.10±14.20</td>
</tr>
<tr>
<td></td>
<td>(62 to 152)</td>
<td>(40.79 to 100)</td>
</tr>
<tr>
<td>SF-36**</td>
<td>72.28±14.09</td>
<td>(44.03 to 98.75)</td>
</tr>
</tbody>
</table>

*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

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

*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.
Impact of Academic Self-efficacy and Stress on the Mental and Physical Well-Being

We would like to thank students who had participated in the 4th National Olympiad of Universities of Medical Sciences in Tabriz, Iran.

References


19. Rivera-Torres P, Araque-Padilla RA, Montero-Simó MJ.

Table 3. Correlations between questionnaires’ data

<table>
<thead>
<tr>
<th></th>
<th>SF-36</th>
<th>SLSI</th>
<th>CSEI</th>
</tr>
</thead>
<tbody>
<tr>
<td>SF-36</td>
<td>1</td>
<td>-0.584*</td>
<td>0.585*</td>
</tr>
<tr>
<td>SLSI</td>
<td>-</td>
<td>1</td>
<td>-0.473*</td>
</tr>
<tr>
<td>CSEI</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

*Correlations are significant at the 0.01 level

Competing interests

There are no conflicts to report for this study.

Acknowledgments

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.


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.


