Correlation between stress scores and self-regulated learning perception scores in Pakistani students

Faezah Siddiqui¹, Rehan Ahmed Khan²

Abstract

Objective: To find out the correlation between levels of stress and self-regulated learning skills in medical students.

Methods: The quantitative correlational study was conducted in January 2018 at the University College of Medicine and Dentistry, Lahore, Pakistan, and comprised regular medical students enrolled in first to fifth year. Data was collected using Perceived stress scale-14 and Self-regulated learning perception scale questionnaires to identify the levels of stress and self-regulated learning skills. Data was collected at one point of time and analysed using SPSS 25.

Results: Of the 350 students approached, 295(84%) filled in the questionnaire. Of them, 118(62.4%) were females and 111(37.6%) were males. No significant differences were found between the scores of male and female students (p>0.05). There was a moderate positive correlation between stress and self-regulated learning skills (p<0.05).

Conclusion: Self-regulated learning skills can play a vital role in coping with stress and identifying a goal.

Keywords: Stress, Self-regulation, Medical education, Challenges, Strategies, Coping, Students (JPMA 70: 447; 2020). https://doi.org/10.5455/JPMA.6674

Introduction

Medical students all over the world come across challenges. Feelings of incompetence along with cultural and social issues further complicate the situation. It has been observed that stress at personal level results in impaired academic performance, suicidal thoughts and abrasion from profession.¹ On a professional level, studies have suggested that stress can lead to pessimism, which negatively affect a student’s ability to care for patients, their rapport with the staff and eventually the culture of medical profession.² In our country the resources are limited, and, as a result, the sources of stress in the life of a Pakistani medical student differ from those in other countries.

The aim of medical education is to accommodate doctors who can aid society to the best of their ability. Consequently, the responsibility of the medical institution involves being able to identify stress and support their students individually on how to manage stress effectively throughout their academic and professional years.³ A number of researchers have proposed different programmes for managing stress that is aimed at helping the students.⁴⁻⁷ An effective strategy that can help medical students cope with stress is self-regulation.⁸ Research also proves that promoting the use of self-regulated learning skills can improve the students’ academic achievements, clinical performance and mental well-being.⁸ The current study was planned to assess the correlation between levels of stress and self-regulated learning skills in medical students.

Subjects and Methods

The quantitative correlational study was conducted in January 2018 at the University College of Medicine and Dentistry (UCMD), Lahore, Pakistan, and comprised regular medical students enrolled in first to fifth year. UCMD is affiliated with the University of Lahore. After gaining approval from the institutional review board, a pilot study was done on a group of 19 students representing all five years to address any issue related to "item language and its understanding" and "time taken to complete the questionnaire". The data from the pilot study was not included in the results.

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The sample size was calculated through OpenEpi online software, using confidence interval (CI) of 95% and margin of error 5%. Any threats towards internal validity of the study were identified and handled accordingly. Data was collected by using Perceived Stress Scale-14 (PSS-14) and Self-regulated Learning Perception Scale (SRLPS) after their validity and reliability were established. The questionnaire consisted of three sections designed on Google forms (Annexure 1). Students signed informed consent before they completed the questionnaire.

The PSS-14 scale consists of 14 questions with a range of options (never, almost never, sometimes, often, very often) on Likert scale from 0 to 4 for each item. These items inquire about the events that occurred one month prior to the survey. Items number 4, 5, 6, 7, 9, 10 and 13 are positively stated questions. Therefore, their score is calculated as reversed (0=4, 1=3, 2=2, 3=1, and 4=0). The final score ranges between 0 and 56. High scores signify high level of stress, while low scores indicate lower level of stress. The range of PSS-14 scores were divided into stratified quartiles. The upper two and lower two quartiles were combined (28 being the operational cut-off value for the upper bound) and were labelled as severe stress, moderate stress, mild stress and no stress respectively. This cut-off value was set in accordance with similar studies in the region.

The SRLPS incorporates 41 items with a range of options (never, almost never, sometimes, often, very often) on Likert scale from 1 to 5 for each item. The minimum possible score for SRLPS is 41 and the maximum 205. Data was collected at one point of time and analysed using SPSS 25. Pearson's correlation was used in order to determine the relationship between the students' stress levels and the self-regulated learning skills. P < 0.05 was taken as significant.

### Results

Of the 350 students approached, 295(84%) filled in the questionnaire. Of them, 118(62.4%) were females and 111(37.6%) were males. No significant differences were found between the the scores of male and female students (p>0.05). Mean PSS-14 score was 29.87±1.59 in females and 29.75±1.99 in males, whereas the mean SRLPS score was 114.66±26.49 in females and 117.91±28.31 in males.

### Table 1: Demographic Characteristics and their Mean Scores of PSS-14 and SRLPS.

<table>
<thead>
<tr>
<th>Variables</th>
<th>n (%)</th>
<th>PSS-14 Mean ± SD</th>
<th>SRLPS Mean ± SD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>184(62.4)</td>
<td>29.87±1.59</td>
<td>114.66±26.49</td>
</tr>
<tr>
<td>Male</td>
<td>111(37.6)</td>
<td>29.75±1.99</td>
<td>117.91±28.31</td>
</tr>
<tr>
<td><strong>Age (years)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-20 years</td>
<td>61(20.7)</td>
<td>29.28±2.37</td>
<td>112.33±23.02</td>
</tr>
<tr>
<td>21-23 years</td>
<td>177(60)</td>
<td>29.92±1.56</td>
<td>115.90±27.43</td>
</tr>
<tr>
<td>24-26 years</td>
<td>57(19.3)</td>
<td>30.12±1.43</td>
<td>119.63±30.34</td>
</tr>
<tr>
<td><strong>Year of study</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First year</td>
<td>45(15.3)</td>
<td>29.47±2.52</td>
<td>115.04±25.64</td>
</tr>
<tr>
<td>Second year</td>
<td>57(19.3)</td>
<td>29.39±2.01</td>
<td>109.14±20.32</td>
</tr>
<tr>
<td>Third year</td>
<td>96(32.5)</td>
<td>29.98±1.41</td>
<td>120.02±29.68</td>
</tr>
<tr>
<td>Fourth year</td>
<td>60(20.3)</td>
<td>30.06±1.36</td>
<td>112.65±26.00</td>
</tr>
<tr>
<td>Fifth year</td>
<td>37(12.5)</td>
<td>30.32±1.31</td>
<td>121.78±32.61</td>
</tr>
<tr>
<td><strong>Residence</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hostel</td>
<td>112(38.0)</td>
<td>29.91±1.57</td>
<td>122.52±32.92</td>
</tr>
<tr>
<td>With Parents</td>
<td>136(46.1)</td>
<td>30.29±1.75</td>
<td>114.43±23.96</td>
</tr>
<tr>
<td>With Relatives</td>
<td>14(4.7)</td>
<td>27.50±1.87</td>
<td>110.58±10.51</td>
</tr>
<tr>
<td>Rental house</td>
<td>33(11.2)</td>
<td>28.61±0.75</td>
<td>110.57±10.51</td>
</tr>
<tr>
<td><strong>Motivation to study MBBS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personal interest</td>
<td>144(48.8)</td>
<td>30.35±2.1</td>
<td>129.98±33.26</td>
</tr>
<tr>
<td>Parental pressure</td>
<td>130(44.1)</td>
<td>29.36±1.2</td>
<td>115.6±2.89</td>
</tr>
<tr>
<td>Random choice</td>
<td>21(7.1)</td>
<td>29.09±0.44</td>
<td>107.81±8.29</td>
</tr>
</tbody>
</table>

### Table 2: Comparison of SRLPS scores between “Stressed” and “Not Stressed” students.

<table>
<thead>
<tr>
<th>Score of PSS-14</th>
<th>Stress level</th>
<th>n (%)</th>
<th>Mean SRLPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 14</td>
<td>No stress</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Up to 28</td>
<td>Mild</td>
<td>184(62.4%)</td>
<td>129.98±33.26</td>
</tr>
<tr>
<td>Up to 42</td>
<td>Moderate</td>
<td>111(37.6%)</td>
<td>115.6±2.89</td>
</tr>
<tr>
<td>Up to 56</td>
<td>Severe</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>

SRLPS: Self-regulated Learning Perception Scale.

On the important factor of motivation to study MBBS, SRLPS score was higher in students 129.98±33.26 studying out of their own choice, and mean SRLPS score was lower in students 115.6±2.89 who were studying MBBS due to parental pressure. However, the mean PSS-14 score of students with personal interest 30.35±2.1 and those under parental pressure 29.36±1.2 was not significant (Table 1). The highest SRLPS score was seen in final year students 121.78±32.61 followed by third year 120.03±29.68, first year 115.04±25.64, fourth year 112.65±26.00 and second year 109.14±20.12.

PSS-14 scores ranged 21-34 SRLPS ranged 82-172 (Table 2).

Pearson’s correlation indicated moderate positive correlation between stress and SRLS (Figure).
Dear Student,

The objective of this study is to measure stress levels and self-regulation skills in medical students of UCMD. Your information will remain confidential. Your participation in the research is highly appreciated. Please, select I agree if you are willing to participate.

**Anxexure: PSS-14 and SRLPS instrument; Levels of Stress and Self-Regulated Learning Skills among Medical Students of UCMD.**

In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?
- Never
- Almost Never
- Sometimes
- Fairly Often
- Very Often

Dimensions and items of the SRLPS

I take action to learn according to my interests.
- Never
- Sometimes
- About half the time
- Most of the time
- Always

I search for possibilities to learn new things.
- Never
- Sometimes
- About half the time
- Most of the time
- Always

When faced with a problem, I take action to solve it.
- Never
- Sometimes
- About half the time
- Most of the time
- Always

I take every opportunity to learn new things.
- Never
- Sometimes
- About half the time
- Most of the time
- Always

I am curious about the causes of things I see, hear or read.
- Never
- Sometimes
- About half the time
- Most of the time
- Always

I derive new learning assignments for myself from the things I observe around me.
- Never
- Sometimes
- About half the time
- Most of the time
- Always

I make a plan to utilize resources and strategies in order to reach my goal.
- Never
- Sometimes
- About half the time
- Most of the time
- Always

I prioritize my goals.
- Never
- Sometimes
- About half the time
- Most of the time
- Always

I manage my time in order to learn as efficiently as possible.
- Never
- Sometimes
- About half the time
- Most of the time
- Always

I make a plan to utilize learning resources efficiently.
- Never
- Sometimes
- About half the time
- Most of the time
- Always

I identify the resources needed during the learning process.
- Never
- Sometimes
- About half the time
- Most of the time
- Always

I clearly identify the objectives to be achieved at the end of the learning process.
- Never
- Sometimes
- About half the time
- Most of the time
- Always

I identify the learning materials that will help me to learn.
- Never
- Sometimes
- About half the time
- Most of the time
- Always

I search for ways to facilitate learning in new situations.
- Never
- Sometimes
- About half the time
- Most of the time
- Always

After any learning assignment, I assess whether I learned the material completely.
- Never
- Sometimes
- About half the time
- Most of the time
- Always

I use different learning strategies for the acquired knowledge to be sustainable.
- Never
- Sometimes
- About half the time
- Most of the time
- Always

I search for new strategies if those used in implementing my plan are inadequate.
- Never
- Sometimes
- About half the time
- Most of the time
- Always

I use different learning strategies for the knowledge that I acquire to be meaningful.
- Never
- Sometimes
- About half the time
- Most of the time
- Always

I assess whether or not my goals are accomplished.
- Never
- Sometimes
- About half the time
- Most of the time
- Always

I strive to eliminate any difficulties I face during the learning process.
- Never
- Sometimes
- About half the time
- Most of the time
- Always

I continuously improve my problem-solving methods.
- Never
- Sometimes
- About half the time
- Most of the time
- Always

I strive to improve my weaknesses in learning.
- Never
- Sometimes
- About half the time
- Most of the time
- Always
Discussion

The fact that no statistically significant differences were found between PSS-14 scores of female and male students was not unexpected.\textsuperscript{15,16} The total SRLPS scores calculated between male and female students showed little variation which was in contrast with a study.\textsuperscript{17} One possible reason for it could be the "private" study setting. Given that a majority of the medical students were from a higher socioeconomic class, it is assumed that their stress and self-regulation levels were not affected by gender.\textsuperscript{16,18} Personal interest is an intrinsic motivator, which helps to identify goals and to make plans to achieve them.\textsuperscript{19-21} Therefore, it was no surprise that PSS-14 score was lower and SRLPS was higher in students who were studying MBBS with their own personal interest.

A number of studies have proved that self-regulation skills are refined over time and are usually highest in final/fifth year.\textsuperscript{22-24} But the fact that self-regulation skills are second most developed in third year was unexpected. One possible explanation to this finding can be the type of curriculum the students are following. The students of fourth and final years studied the traditional curriculum divided as first two years for Basic Sciences and the last three years for Clinical Sciences. In contrast, the current first, second and third year are exposed to an integrated problem-based learning (PBL) curriculum. As third year students have been learning to apply integration for almost three years, their self-regulation skills improve a lot.\textsuperscript{25-27}

In our study a moderate positive correlation between stress and self-regulated learning skills was observed which was contradictory to previous studies.\textsuperscript{8,28} One way to explain this finding is the possibility that some amount of stress is natural part of medical education and might be a motivator for some students.\textsuperscript{29} Looking at the total scores of PSS-14, out of 295 students, 90 scored a maximum of 26 that fall in the lower quartile of stress.\textsuperscript{12,13,14} Since majority of the medical students fall in the lower quartile of stress, it is assumed that mild stress can direct students towards self-regulation. It is a positive sign that the students care about their learning and take stress to make plans accordingly. On the bright side, it can be considered that students are dealing with stress through self-regulation.

As our study was conducted at a single centre, its scope is restricted. Another limitation was related to PSS-14 that can only evaluate the level of stress during the preceding month. Longitudinal surveys should be used to measure stress throughout an entire academic year. A final concern was regarding the total scores obtained through the
questionnaires. It might be a possibility that students under- or over-estimated their stress levels and self-regulated skills.

In future studies it will be prudent to compare self-regulated learning scores of two medical colleges; one following the traditional, and the other following an integrated curriculum.

Conclusion
Stress and self-regulation were found to be independent of gender but self-regulated learning skills played a vital role in coping with stress and identifying a goal. Although stress can be a motivator for some medical students, only low levels of stress helped students to remain focussed.

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References