Effect of an emotional intelligence educational program on perceived and occupational stress of health personnel: a pragmatic cluster randomized controlled trial

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Abstract

Background

coping with occupational stress is vital for health personnel to communicate more with patients and ultimately the interactions between patients and providers impact the quality of care. The current study aimed to investigate the effect of the emotional intelligence training program (EITP) on occupational and perceived stress in health personnel.

Methods

A pragmatic cluster randomized controlled trial study was conducted in Andimeshk Health Centers, located in the northwest Khuzestan province between January and March 2019. Absolute change from baseline to final emotional intelligence (EI), occupational stress (OS), and perceived stress (PS), were measured. Standard questionnaires including Brad-berry & Graves Emotional Intelligence Questionnaire (2004), HSE (UK Health and Safety Executive) Standard Occupational Stress Questionnaire, and Bradberry’s, Cohen's perceived stress, were used. The in-person training program includes two workshops (duration = 6 hours) and a 30-day follow-up.

Results

Out of 80 health personnel, 75 fulfilled the study requirement. (n = 37 allocated into the experiment vs n = 38 control). Baseline emotional intelligence in the experiment group was improved by about 1.16 units versus a non-significant change in the control group (=-1.21). At baseline, there was no significant difference between the experiment and control groups in terms of mean score of OS and PS (p > 0.05). We have observed a non-significant improvement in the experiment group in terms of OS and PS. However, the score changes in the experiment group were significantly higher than in the control group (P < 0.05).

Conclusion

We have shown emotional intelligence improvement could have a significant impact on stress management as so recommended to include EI training in the annual training programs.

Trial registration:

RCT: IRCT20160418027449N4 Date: 25/02/2019

Background
Stress is a common disease of the 21st century that affects people in different conditions (1, 2). Stress is responsible for 30% of illnesses and costs $300-400 million annually. Perceived stress indicates how threatening or challenging people find stressful events to be (3). The most effective model of the stress assessment process has been proposed by Lazarus and Folkman. According to cognitive approaches, a person experiences stress when the assessed stress goes beyond his or her potential and endangers his or her health (3). Lazarus et al. emphasize that people who believe they have auxiliary resources to deal with stress will be less vulnerable to stress (4). One of the major causes of stress in life is work (1). In 1992, the United Nations recognized occupational stress as a disease of the 20th century, and the World Health Organization shortly afterward declared it a worldwide problem. At present, all businesses and workers in all developed and developing countries are involved in this great problem (5). One of the health problems in the environment is the problem of occupational stress and its health consequences, with the International Labor Organization (ILO) calling the 2016 slogan "workplace stress: a social challenge". Based on research and experience, NIOSH (National Institute of Occupational Safety and Health in the United States) agrees that working conditions play a fundamental role in causing job stress, in addition to ignoring individual factors (6, 7).

Effective coping strategies will reduce people's response to severe stress and thus moderate the detrimental effects of stress (8). Emotional intelligence is one of the ways of coping with stress nowadays. Emotional intelligence can facilitate the mechanism of coping with stress and provide the individual with an effective self-regulation system for coping with stress (9). "Ability to evaluate and express one's emotions, regulate one's own and others' emotions, and exploit emotions" is called emotional intelligence first proposed by Mayer and Salovey (10). Over the past 20 years, many organizations have adopted the use of emotional intelligence as an essential function (11, 12). Emotional intelligence has been proven to be an organizing factor for thinking and planning that comes in human-assisted traumatic situations and prevents injury and downfall under heavy pressure (13). Emotional intelligence by managing employees' emotions and emotions and facilitating the exchange of positive emotions between them reduces the negative effects of job stress, making them resistant to early burnout when it has a two-way relationship with mental health (14). According to studies in Asia and Europe, promoting emotional intelligence is not limited to a particular culture. Researchers have suggested that emotional intelligence through stress management has a positive relationship with performance (12). A review of the literature on emotional intelligence in the field of health care has shown that there is a high correlation between the promotion of emotional intelligence in different medical domains and therefore it is recommended that emotional intelligence be added to the medical field (12). Health care personnel needs to focus on empathy to communicate more with patients (15).

Given that it is human resources an essential pillar of any organization's efficiency (5, 16). As a human resource, health care providers are the primary providers of primary health care in every community. Since the implementation of the Health Transformation Program began in 2014, it seems that technological change in the health field can cause occupational stress in health care providers. The process of care and the interactions of patients and providers impact access to health care, the quality and cost of health care, and ultimately public health (17). The purpose of this study was to conduct an educational
intervention based on the training of emotional intelligence components on occupational stress and perceived stress in health care providers of Andimeshk urban health centers. Our findings can be utilized by healthcare practices to match health services to unique population health needs.

**Methods**

**Study design**

This is a pragmatic controlled trial, applying cluster randomization trial (CRT). This study registered with the RCT registration number: IRCT20160418027449N4. Each healthcare center (i.e., cluster) was randomly assigned to an intervention emotional intelligence educational program (EIEP) and control (no intervention) conditions.

**Participants/inclusion and exclusion criteria and recruitment**

The participants were employees of Andimeshk health network, located in Khuzestan province, southwest Iran. The study was conducted after receiving the code of ethics from the ethics committee of Shiraz University of Medical Sciences (IR.SUMS.REC.1397.935). All methods were carried out following relevant guidelines and regulations. Characteristics of health personnel were reported in our previous manuscript (18). In brief, subjects having at least one year of work experience, with no chronic illness (diabetes and hypertension or mental disorders) and consent to participate in the study included in the study.

**Sample size**

To calculate the effectiveness of emotional intelligence training intervention on job stress, the sample size was calculated based on a previous study’s reported effect size (10).

**Intervention**

The intervention consists of two parts: two workshops of 6 hours each (supplementary tables 1 & 2) and following weekly intervention task reminders for all participants. There were two measurement points (Fig. 1): Baseline (before the intervention), and end-of-treatment (after the intervention) in both groups.

To prevent bias and dissemination of educational material between the intervention and control groups, the city was geographically divided into two sites (clusters), which were randomly allocated to intervention (n = 40) and control (n = 40).

**Study questionnaire**

Descriptive information including gender, age, place of employment, employment status, educational background, employment history, marital status, and the number of children was obtained. Primary and secondary outcomes measures include emotional intelligence, perceived stress, and occupation stress.
assessed by self-reported questionnaires, namely Brad-berry's, Cohen's perceived stress, and HSE standard questionnaires.

1) Brad-berry & Graves Emotional Intelligence Questionnaire (2004)

Bradberry's Emotional Intelligence Questionnaire consists of 28 items based on four components (self-awareness, self-management, social awareness, and relationship management). Questions 1 to 6 measure self-awareness, questions 7 to 15 self-management, questions 16 to 20 social awareness, and questions 21 to 28 assess relationship management. The Likert scale is scored using a 6-point scale (never = 1, rarely = 2, sometimes = 3, usually = 4, almost always = 5, always = 6). In questions 6-14-15-20-28 the scoring is done inversely, the score range is between 168 – 28 with a score between 28–78 (low emotional intelligence) score between 128 – 78 (moderate emotional intelligence), and a score between 168 – 128 (high emotional intelligence) calculated. For the structural validity of the study instrument, both methods of convergent validity and factor were used for analysis. The reliability of this test in studies based on Cronbach's alpha coefficient was 0.83. The correlation coefficient of Bradbury-Graves emotional intelligence scores with positive Bar-On emotional intelligence scores was significant at α = 0.01 level. More than 70% of the matrix correlations were statistically significant and no negative correlation was found to be statistically significant. The questionnaire was completed before and one month after the intervention by both intervention and control groups.

2) HSE (UK Health and Safety Executive) Standard Occupational Stress Questionnaire

The standard HSE Occupational Stress Questionnaire consists of 35 questions with 7-sub-scales (demand, control, chief support, peer support, connection, role, change). Role Questions (1–4–11–13–17) Connection Questions (5–14–21–34) Chief Support Questions (8–23–29–33–35) Peer Support Questions (7–24–27–31) Control Questions (2–10–15–19–25–30) Demand Questions (3–6–9–12–16–18–20–22) Change Questions (26–28–32). The Likert scale was scored using a 5-point scale (never = 1, rarely = 2, sometimes = 3, often = 4, always = 5). Scoring on the scale of connection and demand is related inversely. The overall score of occupational stress was calculated in the range of 35 to 175, with a higher score indicating greater health and safety in terms of occupational stressors, so a score of 35 to 70 (High stress), a score of 70 to 105 (Moderate stress), a score of 105 to 140 (Mild stress) and score above 140 (No stress) calculated. The validity and reliability of the HSE questionnaire have been evaluated and validated in previous studies, including the study of Marzabadi et al. The reliability of the questionnaire was calculated by Cronbach's alpha of 0.78. In addition, the split-half method with the Spearman-Brown formula was calculated to calculate the correlation coefficient of 0.65 and its overall validity of 0.92. According to Cronbach's alpha coefficient, its internal consistency was 0.72. The questionnaire was completed before and one month after the intervention by 2-intervention and control groups.

3) Cohen et al. Perceived Stress Questionnaire (pss-10)
The Perceived Stress Questionnaire was developed by Cohen et al in 1983, which is used to measure perceived general stress in the past month. A 10-item questionnaire with two dimensions of perceived helplessness (questions 1,2,3,6,9,10) and perceived self-efficacy (questions 4,5,7,8) was used in this study. Emotions measure stressful events, control, overcome, coping with stress, and the stress experienced. It also examines risk factors for behavioral disorders and illustrates the process of stressful relationships The Likert scale was scored using a 5-point scale (never = 0, almost never = 1, sometimes = 2, often = 3, always = 4). Expressions of item 4,5,7,8 are reversed. The lowest score is zero and the highest is 40. A higher score indicates more perceived stress. Cronbach's alpha for this scale was obtained in three studies of 0.84, 0.85, and 0.86 (21). The questionnaire was completed before and one month after intervention by both intervention and control groups.

**Intervention workshop**

Emotional intelligence training was performed on the intervention group using the Emotional Intelligence Protocol based on Bradbury & Graves (2005) (translated by Mehdi Ganji) (22). The workshop was held for 2-week and each session lasted 6 hours.

The educational content of the first workshop was the components of self-awareness and self-management and in the second workshop the components of social awareness and relationship management. Each component of the training began with lectures and questions on each component, and then the participants were divided into small teaching groups (7–8 people) to practice and group discussion. A video projector was used during lectures. Details information is depicted in supplementary tables 1 and 2.

**Intervention task reminders**

After the workshops, the participants received an SMS once or twice a week containing a short task reminder during working hours (altogether 12 reminders). The task includes some items related to presence and well-being at work.

To ensure that information was not shared between the experiment and control groups, the experiment group was asked to refuse to disclose training points to other colleagues in other health centers by the end of the study.

**Randomization and allocation to trial group**

Researchers were aware of their group assignment at the start of the study. The participants were masked in which community they were assigned to. The group assignment was kept blind from both the groups and the new field researchers.

Andimeshk city with a population of 175,000 has 6 Integrative Healthcare Centers (IHC) and 16 annexed and non-annexed health centers. The city was geographically divided into two parts, and IHC, with all bases covered by each geographical section of the city, was randomly assigned to either experiment (3 centers) or control (3 centers). Therefore, health centers and their bases were divided randomly into
experiment and control groups. IHC 2, 3, and 6 were assigned as experiment groups and IHC 1, 4, and 5 as control groups. Then, the staff completed written consent to participate in the Emotional Intelligence training program. The consent also was obtained at the annexed, non-annexed health centers and the healthcare team of the IHC of the control group who were willing to cooperate in the research.

**Statistical Methods**

To assure comparability of groups, the characteristics of participants were investigated using appropriate statistical inferences test and described in a table. The distribution of data was normal.

To investigate the effect of the emotional intelligence training program (EITP) on perceived and occupational stress of health personnel, we have calculated absolute change from baseline to the outcomes measured. We have used an independent t-test to compare the mean difference in change from baseline between experimental and control.

The significant threshold of P = 0.05 was used in all analyses. Statistical analyzes were performed using STATA version 14 (STATA Corporation, College Station, TX).

**Results**

Based on the inclusion criteria, 80 health personnel residents of urban health centers in Andimeshk were studied. The flow diagram of participant recruitment is depicted in Fig. 1. Participant recruitment began in January 2019 and the intervention phase ended in March 2019. The final follow-up measurements ended in May 2019.

The number of participants in the experimental group was 37 with a mean age of 36 ± 6.03 and the control group was 38 with a mean age of 35 ± 6.49 (total sample size was 75). The demographic variables of the studied subjects are shown in Table 1 and there was no significant difference in demographic variables between the experimental and control groups.
Table 1
Demographic characteristics of health personnel of Andimeshk, Khuzestan

<table>
<thead>
<tr>
<th>Variables</th>
<th>Experiment (%)</th>
<th>Control (%)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age- yrs.</td>
<td>36 ± 6.03</td>
<td>35 ± 6.49</td>
<td>0.813*</td>
</tr>
<tr>
<td>Work experience- yrs.</td>
<td>9.26 ± 6.48</td>
<td>8.73 ± 7.23</td>
<td>0.751*</td>
</tr>
<tr>
<td>Female</td>
<td>35(94.6)</td>
<td>35(92.1)</td>
<td>0.513†</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Associate Degree</td>
<td>8(21.6)</td>
<td>10(26.3)</td>
<td>0.634</td>
</tr>
<tr>
<td>Bachelor’s degree</td>
<td>29(78.4)</td>
<td>28(73.7)</td>
<td></td>
</tr>
<tr>
<td>Employment status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Official, contractual and contractual</td>
<td>22(59.5)</td>
<td>22(57.9)</td>
<td>0.891</td>
</tr>
<tr>
<td>Contractor (transformation plan)</td>
<td>15(40.5)</td>
<td>16(42.1)</td>
<td></td>
</tr>
<tr>
<td>Workplace</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health Center</td>
<td>13(35.1)</td>
<td>16(42.1)</td>
<td>0.116</td>
</tr>
<tr>
<td>Attached Health Base</td>
<td>6(16.2)</td>
<td>13(34.2)</td>
<td></td>
</tr>
<tr>
<td>Non-Attached Health Site</td>
<td>18(48.7)</td>
<td>9(23.7)</td>
<td></td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>26(70.3)</td>
<td>29(76.3)</td>
<td>0.548</td>
</tr>
<tr>
<td>Having children</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>20(74.1)</td>
<td>22(75.9)</td>
<td>0.845</td>
</tr>
<tr>
<td>Number of children</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One</td>
<td>13(65)</td>
<td>11(50)</td>
<td>0.741</td>
</tr>
<tr>
<td>Two or more</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The mean score of emotional intelligence, occupational stress, and perceived stress and its dimensions before and after the intervention are shown in Table 2. Baseline EI, OS, and PS were similar in the experiment and control groups (all P < 0.05). After completion of the training program, we have observed mean scores of EI, OS, and PS differ significantly between experiment intervention and control groups.
Table 2
Emotional intelligence, occupational and perceived stress and its dimensions before and after intervention in health personnel of Andimeshk, Khuzestan

<table>
<thead>
<tr>
<th>Variables</th>
<th>Before</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Experiment</td>
<td>Control</td>
<td>p-value*</td>
<td>Experiment</td>
<td>Control</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Experiment</td>
<td>Control</td>
</tr>
<tr>
<td>Emotional Intelligence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>79.27 ±</td>
<td>76.47 ±</td>
<td>0.09</td>
<td>80.43 ±</td>
<td>75.26 ±</td>
</tr>
<tr>
<td></td>
<td>7.00</td>
<td>7.10</td>
<td></td>
<td>7.80</td>
<td>6.25</td>
</tr>
<tr>
<td>Self-awareness</td>
<td>28.48 ±</td>
<td>26.52 ±</td>
<td>0.02</td>
<td>28.16 ±</td>
<td>25.60 ±</td>
</tr>
<tr>
<td></td>
<td>3.72</td>
<td>3.61</td>
<td></td>
<td>3.51</td>
<td>3.51</td>
</tr>
<tr>
<td>Self-management</td>
<td>37.08 ±</td>
<td>35.92 ±</td>
<td>0.33</td>
<td>38.32 ±</td>
<td>35.47 ±</td>
</tr>
<tr>
<td></td>
<td>5.84</td>
<td>4.43</td>
<td></td>
<td>6.39</td>
<td>4.36</td>
</tr>
<tr>
<td>Social awareness</td>
<td>23.97 ±</td>
<td>22.57 ±</td>
<td>0.04</td>
<td>23.62 ±</td>
<td>21.76 ±</td>
</tr>
<tr>
<td></td>
<td>2.65</td>
<td>3.11</td>
<td></td>
<td>3.14</td>
<td>2.78</td>
</tr>
<tr>
<td>Relationship management</td>
<td>35.64 ±</td>
<td>34.44 ±</td>
<td>0.32</td>
<td>35.89 ±</td>
<td>34.65 ±</td>
</tr>
<tr>
<td></td>
<td>5.11</td>
<td>5.30</td>
<td></td>
<td>5.23</td>
<td>5.18</td>
</tr>
<tr>
<td>Occupational stress</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>110.29 ±</td>
<td>112.39 ±</td>
<td>0.54</td>
<td>116.59 ±</td>
<td>112.13 ±</td>
</tr>
<tr>
<td></td>
<td>15.77</td>
<td>14.06</td>
<td></td>
<td>15.41</td>
<td>14.35</td>
</tr>
<tr>
<td>Role</td>
<td>21.91 ±</td>
<td>20.47 ±</td>
<td>0.03</td>
<td>21.86 ±</td>
<td>19.71 ±</td>
</tr>
<tr>
<td></td>
<td>2.64</td>
<td>3.16</td>
<td></td>
<td>2.51</td>
<td>3.08</td>
</tr>
<tr>
<td>Connect</td>
<td>13.97 ±</td>
<td>14.50 ±</td>
<td>0.52</td>
<td>15.32 ±</td>
<td>14.97 ±</td>
</tr>
<tr>
<td></td>
<td>4.13</td>
<td>3.01</td>
<td></td>
<td>3.14</td>
<td>2.54</td>
</tr>
<tr>
<td>Official support</td>
<td>14.59 ±</td>
<td>15.76 ±</td>
<td>0.17</td>
<td>15.37 ±</td>
<td>14.89 ±</td>
</tr>
<tr>
<td></td>
<td>4.07</td>
<td>3.32</td>
<td></td>
<td>4.01</td>
<td>3.31</td>
</tr>
<tr>
<td>Peer support</td>
<td>13.70 ±</td>
<td>13.31 ±</td>
<td>0.55</td>
<td>14.62 ±</td>
<td>13.13 ±</td>
</tr>
<tr>
<td></td>
<td>3.24</td>
<td>2.27</td>
<td></td>
<td>3.04</td>
<td>2.52</td>
</tr>
<tr>
<td>Control</td>
<td>18.97 ±</td>
<td>18.76 ±</td>
<td>0.83</td>
<td>19.35 ±</td>
<td>18.28 ±</td>
</tr>
<tr>
<td></td>
<td>3.65</td>
<td>4.75</td>
<td></td>
<td>3.52</td>
<td>4.15</td>
</tr>
<tr>
<td>Demand</td>
<td>17.08 ±</td>
<td>20.00 ±</td>
<td>0.03</td>
<td>19.72 ±</td>
<td>21.78 ±</td>
</tr>
<tr>
<td></td>
<td>6.43</td>
<td>5.57</td>
<td></td>
<td>6.44</td>
<td>5.03</td>
</tr>
<tr>
<td>Changes</td>
<td>10.05 ±</td>
<td>9.57 ±</td>
<td>0.38</td>
<td>10.32 ±</td>
<td>9.34 ±</td>
</tr>
<tr>
<td></td>
<td>2.18</td>
<td>2.46</td>
<td></td>
<td>2.23</td>
<td>2.08</td>
</tr>
<tr>
<td>Perceived Stress</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>19.83 ±</td>
<td>17.28 ±</td>
<td>0.19</td>
<td>16.62 ±</td>
<td>16.28 ±</td>
</tr>
<tr>
<td></td>
<td>10.05</td>
<td>6.04</td>
<td></td>
<td>8.53</td>
<td>7.17</td>
</tr>
</tbody>
</table>

Independent t-test*
The amount of change in EI, OS, and PS is depicted in Fig. 2. We have shown that the experiment group has greater improvement than the control group. Although, the change in EI was not significant in both groups but the experimental group showed a significant improvement in the mean score of occupational stress and perceived stress after the intervention (p < 0.05). However, no significant improvement was observed in the mean score of occupational stress and perceived stress in the control group.

The results of the present study showed the effect sizes of educational intervention through Cohen's method significantly improved perceived stress.

### Discussion

The purpose of this study was to investigate the short-term impact of emotional intelligence-based training through face-to-face workshops on occupational stress and perceived stress in health personnel.

**A. Emotional Intelligence**

In the present study, after the intervention, the mean score of emotional intelligence in the experiment group was significantly higher than the control group. In other words, emotional intelligence training in the experimental group had a positive effect, which is consistent with the results of the studies, Abbasi in Emergency Residents, Gholizadeh in Students, and Kozlowski on Australian Nurses, Dacre in English Students (23–26). Therefore, it can be claimed that educational intervention had a positive effect on the participants in the experiment group, in other words, emotional intelligence is a learning and teaching skill.

The results of the present study showed that there was no significant difference between the participants in the experiment and control groups before the intervention, but after the intervention, the self-management component score in the experiment group was increased and there was a significant difference between the two groups. Therefore, it can be claimed that the educational intervention promoted self-management in the experiment group, which is in line with Halamova's study of Slovak students (27). It seems that emotional intelligence educational intervention has been more effective on the self-management component.

### B- Occupational stress
In the present study, there was a significant improvement in the mean score of occupational stress after the intervention in the experiment group, while no significant change was observed in the control group. The findings are consistent with Forouhar’s study of Tehran’s municipal staff and Nooryan’s study of Armenian physicians and nurses (10, 28). Similar studies of the effects of emotional intelligence associated with occupational stress such as the Nakhaie study of nurses’ anxiety, the comments on nurses’ resilience, Sharif and Ghorban Shiroudi on nurses’ general health, Akhund Lotfali on nurses’ occupational conflict, Shahid in Chicago Residents’ stress management and well-being, Meng on the stress of nursing students in China, Castillo on physical and anxiety symptoms in Hispanic adolescents, were consistent with the present study (29–34).

The results of this study showed that there was a significant difference only in the field of peer support after intervention between the two groups. According to an Esmaili study of young clients referring to counseling centers, the greatest impact of emotional education was on peer relationships, which is consistent with the present study (peer support) (35). It seems that emotional intelligence training in the experiment group caused more empathy among them, which had a positive effect on the relationships between peers and reduced stress among the experiment group, which resulted in a significant difference in peer support after the intervention. According to Table 3, we observed a significant difference between job stress and term of connection score in only the experiment group. Because there was a significant difference in demand component after intervention between both experiment and control groups, assumed that a factor other than intervention such as changing a work plan and organizational factors have an impact on it. Since only in the experiment group, did the connection component have a significant difference, the results of this study showed emotional intelligence improved the relationships between individuals and their social abilities. Therefore, it seems that in the present study, emotional intelligence training intervention was more effective on peer support and communication factors.

C- Perceived stress

In the present study, after the intervention, the mean score of perceived stress in the experiment group was significantly lower than before the intervention. This finding was consistent with a study by Nouri on high school boys and Jung’s study in South Korea (9, 36). The study of Benzo is in line with US health care providers (37). The results of this study showed that emotional intelligence educational intervention was more effective on perceived helplessness than perceived self-efficacy because in the excrement group, before and after the intervention, a significant difference in the component of helplessness was observed.

Conclusions

The present study showed that emotional intelligence training intervention had a positive effect on occupational stress. Based on research and experience, the NIOSH (National Institute of Occupational Health and Safety in the United States) agrees with the view that working conditions play a primary role in creating job stress, in addition to not ignoring the role of individual factors (7). Therefore, to have a greater effect of emotional intelligence training on job stress, another auxiliary training such as a total
quality management program (TQM) seems necessary. It is recommended that emotional intelligence training be included in the routine annual training program. The city where the study was conducted may not be representative of other settings, and the short duration of intervention may not result in a clinically significant impact, so further studies will be needed to generalize the results.

**Abbreviations**

EQ
Emotional Quotient
EITP
Emotional Intelligence Training Program
OS
Occupational Stress
PS
Perceived Stress
ILO
International Labor Organization
NIOSH
National Institute of Occupational Health and Safety
EIEP
Effect of Emotional Intelligence Training Program
HSE
Health and Safety Executive
TQM
Total Quality Management

**Declarations**

**Ethics approval and consent to participate**

The study was approved by the Ethics committee of Shiraz University of Medical Sciences (IR.SUMS.REC.1397.935). Informed consent was obtained from all subjects. RCT registration number: IRCT20160418027449N4.

**Consent for publication**

Not applicable

**Availability of data and materials**

The datasets generated during and/or analyzed during the current study are available from the corresponding author (Morteza Khafaie) on reasonable request.
Competing interests

The authors declare no competing interests.

Funding

Not applicable' for that section.

Authors’ contributions

M.H, T.R, and M.A.K researched, wrote, discussed, and edited the manuscript. M.F contributed to the data analysis and discussion. M.A.K is the guarantor of this work and, as such, had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

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References


Table 3

Table 3 is not available with this version.

Figures

Figure 1

Subject's recruitment flowchart for the emotional intelligence training program.

Figure 2

Absolute change from baseline in emotional intelligence, occupational, and perceived stress. Error bars indicate a 95% confidence interval.

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- completedCONSORTchecklist.docx
- supplementarytables.docx