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The Role of Emotional Schemas in Anxiety and Depression among Russian Medical Students

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Background. Academic success in a higher education institution requires the ability to process large amounts of information in a relatively short period of time, including having proficiency at a high level of basic knowledge, and an ability to cope with stress. Continual study overload, a competitive environment, and ethical dilemmas (e.g. "How should I deal with human suffering?", "How should I convey the diagnosis?", "How should I tell someone that palliative treatment is the only option?", "What if I make a mistake?") can all result in anxiety and depression. Research has shown that students who show signs of anxiety and depression may have maladaptive cognitive strategies for processing their emotional experiences. In the medical community, the rules concerning one's own emotions are, on one hand, determined by specific ethical standards (e.g., the idea that physicians should not show their emotions), and on the other, by the stressful situation itself, which requires taking responsibility for another person's life. The additional stress point is the need for constant study, which requires a pro-active attitude and learning more and more skills. A significant number of physicians tend to ignore their own emotional experiences, or suppress them. The present study deals with indications of anxiety and depression on the basis of such emotional schemas, which we suggest play the key role in the development of emotional maladaptation in medical students**.**

Objective. In this study we observe signs of *anxiety and depression* in medical students and their dependence upon the intensity of dysfunctional emotional schemas.

Design. The number of participants was 400, comprised of students from general medicine (n = 300) and dentistry (n = 100) at the Moscow State University of Medicine and Dentistry.

Methods. We took from the Symptom Check List-90-Revised (Russian version, N.V. Tarabrina N.V.) the subscales related to affective and anxiety disorders: anxiety, depression, interpersonal sensitivity, obsessive-compulsiveness, somatization, and phobic anxiety. We also used 28 items from the Leahy Emotional Schema Scale II (the Russian version, adapted by the authors and Y.A. Kochetkov).

Results. The medical students fell into two groups: those with low and those with high intensity of the dysfunctional schemas. The groups were distinguished by which of

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Leahy's basic emotional regulation strategies, either normalizing or pathologizing, they used. The pathologizing students followed strict, maladaptive rules concerning their emotional experiences. Students with intense dysfunctional schemas also demonstrated signs of anxiety, depression, obsessive-compulsiveness, and somatization. The students who saw their emotions as normal demonstrated lower levels of dysfunctional emotional schemas. As stated in Leahy's emotional schemas theory, such students tend to see their emotions as a normal, important, and meaningful part of their daily lives. Analysis has shown that these types of students exhibit lower levels of anxiety, depression, obsessive-compulsiveness, somatization, and interpersonal sensitivity. Regression analysis demonstrated that emotional schemas are significantly related to emotional maladaptation in students. The analysis also allowed us to determine the association of different emotional schemas with the development of anxiety, obsessive-compulsiveness, somatization, and interpersonal sensitivity. Adoption of emotional schemas correlated with the symptoms of depressive and anxiety disorders.

Keywords: emotional schemas, anxiety, depression, medical students, emotional self-regulation.

Introduction

During the last few decades, affective disorders have become more common in Russian young adults (Garanyan & Kholmogorova, 1999; Voytsekh, 2006; Dozortseva, 2006; Shifner, 2011; Garanyan & Shchukin, 2014; Matyushkina, 2016). Some studies report a high level of affective disorders in students, with one focus group reporting a rate as high as 20% to 30% (Kholmogorova, 2006). Among medical students, anxiety and depression are the most typical reactions to overload and stress; these reactions negatively impact their quality of life, as well as their social and emotional adaptation (Hope & Henderson, 2014)

Academic success at an institution of higher education requires an ability to process large amounts of information in a relatively short timeframe, a high level of basic knowledge, and an ability to cope with stress (Chandavarkar, 2007). A perpetual study overload, competitive environment, and the treatment of ethical dilemmas (e.g. "How should I deal with human suffering?", "How should I convey the diagnosis?", "How should I tell someone that palliative treatment is the only option?", "What if I make a mistake?") can result in anxiety and depression (Sirota et al., 2016). However, some authors state that personality traits have a more significant impact on the development of affective disorders in students (Brown & Gunderman, 2006)

Medical students face both emotionally intense negative (e.g. suffering, death, unsafety), and emotionally-intense positive (e.g., strong role-models of compassion, empathy, patient-oriented behavior) events (Feudtner et al., 1994; Monroux-eet al., 2014; Rees et al., 2015; Branch et al., 2001).

Medical students report symptoms of anxiety, depression, burn-out, and in some cases even demonstrate signs of post-traumatic stress disorder (Tschernig et al., 2000). Previous studies have also shown that medical students experience decreasing empathy and increasing cynicism; for patients this often leads to less-than-ideal care, and for the students themselves, dropping out of medical school (Thomas et al, 2007). It is crucial to understand the strategies used by medical stu-

dents to regulate their emotions, and the broader impact of those strategies. Yet a relatively small number of studies deal with the students´ emotional regulation (Monrouxe et al., 2015). It has been shown that adequate emotional regulation contributes positively to the productivity and wellness of medical professionals (e.g., they pay more attention to the patient and spend more time on them) as well as leading to decreased burn-out and increases in positive emotions (Zammuner et al., 2003).

A growing number of authors describe the importance of emotional reflection for the development and maintenance of psychological disorders (e.g., Naderi et al., 2015). Some studies show that, in coping with patients' worries, some physicians tend to avoid their own emotions and distance themselves from these emotions (Shapiro, 2010). It has also been shown that physicians who tend to repress their negative emotions about their patients are more likely to develop signs of anxiety and depression (Sung et al., 2009). In other words, the authors suggest that emotional repression has a negative impact and leads to the development of affective disorders. Specific strategies and rules concerning managing one's emotions are manifested by specific emotional schemas (Leahy, 2002). Among the new approaches to the problem of emotional regulation is Leahy's theory of emotional schemas.

Studying dysfunctional emotional schemas can be considered a new approach to understanding the role of personal factors in emotional adaptation/maladaptation. Leahy's theory of emotional schemas is based on the emotional-focus model (Greenberg, 2002), as well as on meta-cognitive theory (Wells, 1995). Emotional schemas are the subjective beliefs, ideas, and structures which people use as a response to activation of any strongly experienced emotion. A cluster of interpretations and expectations about one's own and other people's emotions is defined as an emotional schema: it involves what a person thinks about his/her and other people's emotions, and which behavioral and interpersonal strategies they use in response. (Leahy & Tirch, 2011).

The model of emotional schemas includes two emotional coping strategies: normalizing and pathologizing. The process of emotional normalization starts from the idea that emotions can be accepted and expressed adequately, and that they are temporary and reflect contextual value (emotions receive their value in context of the situation). By contrast, in the process of pathologizing coping, negative emotions are considered unique, long-term, and dangerous for the person who experiences them; the person therefore feels the need to repress or control them (Leahy & Kaplan, 2004).

It has been suggested that the emotional schemas one chooses are based on emotional experiences and interactions with significant others. Studies have shown that maladaptive emotional schemas are strongly connected to depression, anxiety, post-traumatic stress disorder, disagreements over family-functioning, and personality disorders (Leahy, 2003). There is a lack of research on emotional schemas and how they are related to students' emotional vulnerability.

Despite the importance and necessity of finding predictor variables concerning emotional maladaptation in students, there are not enough studies dealing with the cognitive factors engaged in the development of negative experiences. The subject of this study was to assess the dysfunctional emotional schemas which lead to anxiety and depressive experiences in medical students.

Methods

The number of participants was 400, comprised of students from general medicine (n = 300) and dentistry (n = 100) attending the Moscow State University of Medicine and Dentistry. The average age was 20 (14 ± 7,25). We had 249 female and 151 male participants. There were 60 participants from the first year of study (n = 60), 50 from the second year (n = 50), 140 from the third (n = 140), 50 from the fourth (n = 50), and 100 from the fifth (n = 100). All the participants had filled out several diagnostic questionnaires.

In order to study the emotional schemas' intensity and structure, we adapted (2016) the "Leahy Emotional Schema Scale II" (2012). The questionnaire included 28 items, two per each schema, and allowed us to evaluate the participants' dysfunctional cognitive schemas about their emotions. The emotional schema scale is a one-factor scale. It evaluates the presence of dysfunctional styles of interpreting emotions. Cronbach's alfa reached the point of 0.80, which indicated a sufficient level of internal consistency. The Kaiser-Guttmann criterion equaled 0.83. Correlation between the subscales equaled 0.716.

Although this is a one-factor structure scale, it assesses the following 14 emotional schemas:

1) **Incomprehensibility**, e.g. "My emotions do not make any sense!"
2) **Loss of Control**: I can surely lose control of my emotions.
3) **Duration**: I will feel this emotion for a very long time.
4) **Devalued**: I should not feel any of this.
5) **Simplistic View of Emotion**: It is hard to understand complex emotions.
6) **Blame**: It is other people who determine my emotional state.
7) **Low Consensus**: The others are just not able to feel the same as I do;, they feel something else.
8) **Low Expression**: I should not openly express my emotions.
9) **Simplistic View of Emotion**: Complex feelings are hard to accept.
10) **Guilt**: My emotions are shameful, wrong, and inappropriate.
11) **Rumination**: I am constantly thinking about my emotions and where they are coming from.
12) **Numbness**: I do not have any feelings.
13) **Invalidation**: Others will not accept my emotions; they will ignore and devalue my feelings.
14) **Overly Rational**: It is better to stay rational.

In order to study the broad extent of anxiety and depression, we used specific subscales from the "Symptom Check List-90-Revised" (1994) by L. Derogatis, adapted by N.V. Tarabrina (2007). We used the following subscales: anxiety, depression, interpersonal sensitivity, obsessive-compulsiveness, somatization, and phobic anxiety. To evaluate the validity of the Russian adaptation, we used a-coefficient (the variation of Ruder-Richardson 20) as a confidence criterion. The final coefficients were sufficiently distributed between 0.77 (lower coefficient for the psychoticism subscale) and 0.90 (higher coefficient for the depression subscale). Test-retest coefficients were obtained from the data of 94 psychiatric patients' data. These pa-

tients were examined upon intake and then a week after, before the first therapeutic session. Most of these coefficients were between 0.80 and 0.90.

We performed statistical analysis in "Statistica 10.0, SPSS 21.0".

Results

Cluster profiles of emotional schemas in students

In the first part of the study, in order to define the specific structure of the students' emotional schemas, we performed a two-stage cluster analysis that allowed us to divide the group on the basis of the emotional schema questionnaire. We used the total score from the emotional schemas questionnaire and then divided it into two values according to the Akaike Information Criteria.

As a result, two cluster modules were defined. We compared the groups on individual schemas. The mean silhouette measure of cohesion and separation was 0.3. We used k-means to identify which students went into which final cluster. The first cluster included students with a lower intensity level of dysfunctional emotional schemas (n = 256); the second cluster included students with a higher intensity level of dysfunctional emotional schemas (n = 144). The differences between the clusters can be seen in *Table 1*.

Table 1

Cluster profiles of emotional schemas in medical students

Emotional schemas in students	Low level of dysfunctional schemas' manifestation Cluster 1 (n = 256)		High level of dysfunctional schemas' manifestation Cluster 2 (n = 144)		Distribution difference according to Mann–Whitney U test
	M	SD	M	SD	
Invalidation	2.53	0.78	3.33	1.10	0.001
Incomprehensibility	2.64	0.88	3.68	1.01	0.001
Guilt	1.58	0.67	3.09	1.03	0.001
Simplistic View of Emotion	4.30	1.13	4.35	1.12	0.888
Devalued	2.79	1.12	2.67	1.24	0.235
Loss of Control	2.30	1.05	4.10	1.10	0.001
Numbness	2.25	0.96	3.17	1.07	0.001
Overly Rational	3.07	1.15	4.13	1.25	0.001
Duration	2.61	0.96	3.24	1.07	0.001
Low consensus	2.44	1.11	2.87	0.96	0.001
Non-Acceptance of Feelings	2.13	0.77	3.50	0.94	0.001
Rumination	2.80	1.04	4.36	1.02	0.001
Low expression	2.59	0.93	3.19	1.15	0.001
Blame	2.79	1.03	3.36	1.17	0.001

M = mean value; SD = standard deviation.

The results showed that the students from the two clusters demonstrated significant differences in almost all dysfunctional schemas. The only areas where we did not see any difference were in "Simplistic view of emotion" and "Devalued".

Results on anxiety and depression in medical students

The study of the students' emotional maladaptation showed that in the group where dysfunctional emotional schemas were most evident, the signs of anxiety and depression were significantly stronger. In addition, we found that in students from the second cluster, the scores on the subscales of "Somatization," "Obsessive-compulsiveness," and "Interpersonal sensitivity" were significantly higher.

One can see the results in *Table 2*.

Table 2

Emotional maladaptation (by SCL-90R)

Emotional maladaptation (SCL-90R)	Low level of dysfunctional schemas' manifestation (Cluster1; n = 256)		High level of dysfunctional schemas' manifestation (Cluster 2; n = 144)		Distribution difference according to Mann–Whitney U test
	M	SD	M	SD	
Somatization	0.48	0.22	1.22	0.66	0.04
Obsessive-compulsiveness	0.88	0.47	1.56	0.43	0.001
Interpersonal sensitivity	0.75	0.56	1.44	0.67	0.001
Anxiety	0.71	0.56	1.44	0.90	0.05
Phobic anxiety	0.34	0.22	0.53	0.22	0.442
Depression	0.68	0.44	1.08	0.33	0.01

M = mean value; SD = standard deviation.

In order to establish significant predictors associated with the development of anxiety, depression, interpersonal sensitivity, phobic anxiety, and obsessive-compulsiveness, we used multiple linear regression (hierarchically entering the variables into the regression model). All subscales of the emotional schemas inventory were included in the regression analyses, but only the subscales that had statistical significance for multiple regression models were presented in the study results.

Anxiety and emotional schemas

The first run of regression analysis was aimed at defining the emotional schemas significantly associated with anxiety. The results can be seen in *Table 3*.

Multiple regression analysis has shown that a general level of anxiety is associated with the following emotional schemas: "Simplistic view of emotion" (e.g., I prefer to clearly understand what I feel about the other person), "Non-acceptance

of feelings" (e.g., I should avoid some feelings and emotions), and "Invalidation" (e.g., Other people do not care) ($F = 17.80$, $p = 0.001$). This model explains the 43% dispersion variance ($R^2 = 0.437$).

Table 3

Emotional schemas' impact on general level of anxiety

Dependent variable: Anxiety	**$R^2 = 0.437$**	**B**	**t**	**p**
Simplistic view of emotion		0.395	5.56	0.001
Non-acceptance of feelings		0.174	2.54	0.01
Invalidation		0.208	3.20	0.001

Interpersonal sensitivity and emotional schemas

The second run of regression analysis was aimed at defining the emotional schemas most common for interpersonal sensitivity. The results can be seen in *Table 4*.

Table 4

Emotional schemas' impact on interpersonal sensitivity

Dependent variable: Interpersonal sensitivity	**$R^2 = 0.419$**	**B**	**t**	**p**
Rumination		0.337	4.71	0.001
Incomprehensibility		0.267	4.04	0.001
Invalidation		0.218	3.38	0.001
Overly rational		–0.213	–3.27	0.001
Blame		0.145	2.16	0.03

Multiple regression analysis has shown that general level of interpersonal sensitivity is associated with the following emotional schemas: "Rumination" (e.g., When I feel low, I often sit alone and think about how miserable I am); "Incomprehensibility" (e.g., There are things about myself that I just don't understand); "Invalidation" (e.g., The others do not care); and "Blame" (e.g., If other people changed, I would feel a lot better). This contrasts with "Overly rational", which had a lower score ($F = 19.39$, $p = 0.001$). This model explains the 41% dispersion variance ($R^2 = 0.419$).

Depression and emotional schemas

The third run of regression analysis was aimed at defining the emotional schemas most common for depression. The results can be seen in *Table 5*.

Multiple regression analysis has shown that general level of depression is conjointly influenced by the following emotional schemas: "Rumination", "Incompre-

hensibility", "Invalidation," and "Overly rational" (It is important for me to be reasonable and practical rather than sensitive and open to my feelings) ($F = 17.80$, $p = 0.001$). This model explains the 43% dispersion variance ($R^2 = 0.437$).

Table 5

Emotional schemas' impact on interpersonal sensitivity

Dependent variable: Depression	**$R^2 = 0.437$**	**B**	**t**	**P**
Rumination		0.395	5.56	0.001
Incomprehensibility		0.174	2.54	0.01
Invalidation		0.208	3.20	0.001
Overly rational		–0.156	–2.42	0.01

Obsessive-compulsiveness and emotional schemas

The fourth run of regression analysis was aimed at defining the emotional schemas most common for obsessive-compulsiveness. The results can be seen in *Table 6*.

Table 6

Emotional schemas' impact on obsessive-compulsiveness

Dependent variable: Obsessive-compulsiveness	**$R^2 = 0.333$**	**B**	**T**	**P**
Rumination		0.236	2.95	0.003
Incomprehensibility		0.232	3.18	0.001
Loss of control		0.211	2.64	0.009

Multiple regression analysis has shown that general level of obsessive-compulsiveness is conjointly influenced by the following emotional schemas: "Rumination," "Incomprehensibility," and "Loss of control" (If I let myself have some of these feelings, I fear I will lose control) ($F = 11{,}43$, $p = 0{,}001$). This model explains the 33% dispersion variance ($R^2 = 0.333$).

Somatization and emotional schemas

The fifth run of regression analysis was aimed at defining the emotional schemas most common for somatization. The results can be seen in *Table 7*.

Multiple regression analysis has shown that general level of somatization is conjointly influenced by the following emotional schemas: "Rumination," "Incomprehensibility," "Loss of control," and "Guilt" (Some feelings are wrong to have) ($F = 12.47$, $p = 0.001$). This model explains the 27% dispersion variance ($R^2 = 0.276$).

Table 7

Emotional schemas' impact on somatization

Dependent variable: Somatization	$R^2 = 0.276$	β	T	p
Rumination		0.269449	3.15	0.001
Incomprehensibility		0.282413	3.68	0.000
Loss of control		0.184069	2.32	0.021
Guilt		0.177456	2.15	0.032

Phobic anxiety and emotional schemas

The sixth run of regression analysis was aimed at defining the emotional schemas most common for phobic anxiety.

Table 8

Emotional schemas' impact on phobic anxiety

Dependent variable: Phobic anxiety	$R^2 = 0.266$	B	t	p
Incomprehensibility		0.282413	3.68	0.000
Loss of control		0.184069	2.32	0.021
Blame		0.177456	2.15	0.032

Multiple regression analysis has shown that general phobic anxiety is conjointly influenced by the following emotional schemas: "Rumination", "Incomprehensibility", "Loss of control", and "Blame" ($F = 7.26$, $p = 0.001$). This model explains the 26% dispersion variance ($R^2 = 0.266$).

Discussion

The findings of the present study are in line with the existing research showing that medical students are a vulnerable group (Dyrbye & Thomas, 2006).

Students with intense dysfunctional emotional schemas face anxious and depressive experiences more often than others (Kamali & Gharraee, 2013).

Cluster analysis allowed us to divide the respondents into two groups. The first group of students demonstrated a lower level of dysfunctional emotional schemas. According to the theory of emotional schemas, such students tend to see their emotions as normal, important, and meaningful parts of everyday life (Khawaja & Chapman, 2007).

The students from the second cluster had, on average, stricter but maladaptive rules about their emotional experiences. In other words, the students from the second cluster tended to think that others will devalue and ignore their emotions.

Such students tended to think that their emotions mean nothing, and so they do not think about their meaning. They more often had a belief that expressing emotions is wrong and shameful.

In other words, students from the second cluster tended to suppress their emotions. Some studies show that suppression is the most common strategy for professions that require high levels of control, such as serving on a police force, court, or in the military (Tull et al., 2007). Moreover, some studies state that emotional disregard is a necessary adaptive strategy for students because emotions consume one's cognitive resources, leading people to think more about their emotional object than about the actual task (Ellis & Ashbrook, 1988). Therefore, controlling one's emotions are associated with cognitive skills of task management and negatively affect productivity (Meinhardt & Pekrun, 2003). In this case, emotional suppression leads to short-term regulation, so that a student can gain control and manage with the task.

However, despite the fact that emotional suppression can be a pragmatic short-term survival strategy, it has some potentially serious long-term consequences for the doctors, patients, and the system at large. Numerous studies mention increasing depersonalization and burn-out, as well as a deficit of empathy among medical students, and state that distancing one's self from one's own inner life leads to distancing one's self from a patient (Neumann et al., 2011).

Moreover, the participants from the second cluster saw their emotions as less controllable; they more often distance themselves from their emotions, rationalized them, and tended to think that an emotion will last for a very long time. Statistically, such students tended to use maladaptive regulation strategies such as "Non-Acceptance" and "Blame" more often than others. In fact, a number of studies show that medical students tend to avoid places, events, or even patients who trigger intense emotional experiences (Fritz & Sonnentag, 2006).

Finally, the participants from the second cluster tended to think that others rarely experience the emotions they do; they focus and reflect on their own specific emotional experiences. Students in this cluster also had a tendency for low emotional expressiveness: as the cluster analysis has shown, they did not want to experience and express emotions.

We should also mention that students with dysfunctional emotional schemas had a tendency for compulsiveness and intrusive ruminating thoughts. According to cognitive avoidance theory, people who repress their emotional experiences often end up expressing them through negative output (Borkovec, 2004).

The results of the present study correlate with previous studies, which have shown that some emotionally vulnerable students tend to experience constant tension, worry, depression, and difficulties in problem solving; they also tend to catastrophize problems (Barikana, 2007; Rizvi, 2011).

Regression analysis demonstrates that certain emotional schemas are significantly associated with emotional maladaptation in students. The regressions demonstrated associations between different emotional schemas and anxiety, obsessive-compulsiveness, somatization and interpersonal sensitivity.

First, symptoms of anxiety correlate with having problems accepting difficult, ambivalent emotions. Moreover, the higher the general level of emotional sensitiv-

ity, the lower score the "Overly rational" schema has. We suggest that a decreased ability to understand emotions is a form of cognitive vulnerability. The regression model of emotional schemas correlating with depression is similar to the model of schemas correlating with interpersonal sensitivity, which may suggest general similarity of these psychopathological clusters. The overall character of these clusters also correlates with the development of obsessive-compulsiveness.

Second, both obsessive-compulsiveness and somatization may be partly explained by compulsive focusing on certain emotional states (cf. fixation on interpersonal sensitivity), and the search for their causes (cf. externalization in interpersonal sensitivity), as well as a lack of comprehensibility, uncertainty in one's ability to control one's emotions, and a belief that experiencing one's own emotions is shameful, wrong, or awkward (cf. both depression and interpersonal sensitivity).

Third, the belief that emotional experiences are useless may correlate with phobic behavior.

Conclusions

This problem demands further research, including an examination of the link between emotional schemas and psychopathology. Thus, we should analyze the circumstances for the development of emotional schemas both in medical and non-medical students, and define whether there is a link between certain emotional schemas and maladaptation.

Limitations

The present study should not be generalized to all students. The results are correlational, not causal. As the data were not longitudinal, we also did not trace the dynamics of emotional schemas from one educational year to another.

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