

Burnout syndrome among medical students in Kazakhstan

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Abstract

This study aims at investigating burnout and associated factors in a sample of medical students from Astana Medical University, using the Russian version of the Copenhagen Burnout Inventory - Student Survey (R-CBI-S). 771 medical students responded. The study included socio-demographic and personal questions and a tool to measure burnout. Statistical analyses included measures of descriptive statistics and logistic regression analysis for evaluating burnout. Overall, 28% of medical students reported burnout; R-CBI-S mean score was 40. There is no significant gender difference in burnout. On regression analysis, to be a 2nd-year student, compare to dormitory students live at home or rented a house, having suicidal ideation, having thoughts of dropping out, having interpersonal relationship problems with family or friends, smoking, using alcohol were independently associated with increased risk for burnout. Enrolling in a medical university by its own decision and having satisfaction with academic performance is associated with a decrease of developing burnout syndrome. In conclusion, factors associated with burnout were identified.

Introduction

Burnout is a growing epidemic among medical students that has been shown to have psychological and performance-related detriments (Bullock et al., 2017). Medical students are not only more likely to be burned out compared to the general population, but are increasingly likely to suffer burnout as they advance in their medical training (Dyrbye et al., 2014; Dyrbye et al., 2006). This often leads to significant psychological changes that manifest as depression, insomnia, substance abuse disorders, poor physical health, psychosomatic conditions, relational problems, social withdrawal, and professional dysfunction (Almeida et al., 2016; Aguiar et al., 2009). Burnout can also affect medical students' will to continue to espouse professional qualities, such as honesty, integrity, altruism, and self-regulation (Dyrbye et al., 2010). Based on these findings, it is clear that burnout is a serious problem in the training and professional development of medical students.

Several methods have been developed to study burnout among students, namely the Maslach Burnout Inventory - General Survey for Students (MBI-SS; Maslach, Jackson, & Leiter, 2017), the Oldenburg Burnout Inventory for college students (OLBI-S; Demerouti & Bakker, 2008), and the Copenhagen Burnout Inventory (CBI) proposed by Kristensen et al. (2005). The MBI-SS assesses the prevalence of burnout based on subjects' emotional exhaustion, depersonalization and reduced professional satisfaction and effectiveness as captured by 22 items. OLBI-S includes two dimensions, such as exhaustion and disengagement, with the distinction that it captures exhaustion across physical, affective, and cognitive dimensions compared to the single emotional dimension measured by MBI-SS (Demerouti & Bakker, 2008). By comparison, CBI focuses only on fatigue/emotional exhaustion, but measures the respondent's attribution of this exhaustion to three different life domains: Personal Burnout, Work-related Burnout, and Client-related Burnout (Molinero Ruiz, Basart Gómez-Quintero, & Moncada Lluís, 2013). Campos, et al. (2013) adapted the CBI original inventory for students as CBI-Student Survey, and developed items

measuring student's Personal Burnout, Studies-related Burnout, Colleague-related Burnout, and Teacher-related Burnout.

This study aims at investigating burnout prevalence and related factors in a sample of medical students of the Astana Medical University, Kazakhstan. To the best of our knowledge, this is the first study of burnout among medical students in Kazakhstan.

Materials And Methods

Participants and Procedure

All medical students at any stage of medical education at Astana Medical University were eligible to participate. Participants were invited via the "messengers" app and the university's information portal, Sirius, to fill out an online questionnaire created on the 1ka platform (www.1ka.si) during the period October 2019 – December 2019. 771 completed the questionnaire (response rate 40%). The mean age of the respondent was 20.7 years (18–33). Table 1 presents baseline socio-demographic and personal data of participants.

Table 1. Characteristics of the study population. Odds Ratio (OR) of factors associated with burnout among medical students

Characteristics (n, %)	Burnout n (%)	p-value	OR (95% CI)
Gender (n=771)			
Male (193, 25.0)	56 (29.0)	0.721	1
Female (578, 75.0)	160 (27.7)		0.94 (0.65–1.34)
Year in medical school (n=771)			
1 st year (218, 28.3)	43 (19.7)	0.000	0.68 (0.42–1.09)
2 nd year (137, 17.8)	60 (43.8)		2.25 (1.33–3.47)
3 rd year (125, 16.2)	37 (29.6)		1.16 (0.69–1.94)
4 th year (62, 8.0)	15 (24.2)		0.88 (0.45–1.72)
5 th year (60, 7.8)	16 (26.7)		1.00 (0.51–1.95)
6 th year (169, 21.9)	45 (26.6)		1
Accommodation (n=771)			
In student dormitory (143, 18.6)	28 (19.6)	0.021	1
Rental housing (193, 25.0)	51 (26.4)		1.47 (0.87–2.49)
At home (435, 56.4)	137 (31.5)		1.89 (1.19–2.99)
Decision to study at a medical school (n=771)			
Other reason (27, 3.5)	17 (63.0)	0.000	1
Parents' decision (129, 16.7)	53 (41.1)		0.41 (0.17–0.97)
Its own decision (615, 79.8)	146 (23.7)		0.18 (0.08–0.41)
Part-time job (n=771)			
No (583, 75.6)	158 (27.1)	0.320	0.83 (0.58–1.19)
Yes (188, 24.4)	58 (30.8)		1
Extracurricular activities (n=771)			
No (483, 62.65)	125 (25.9)	0.088	1
Yes (288, 37.35)	91 (31.6)		1.32 (0.96–1.82)
Suicidal ideation (n=472)*			
No (395, 83.7)	96 (24.3)	0.000	1

Yes (77, 16.3)	55 (71.4)		7.79 (4.51–13.43)
Thoughts of dropping out (n=473)*			
No (291, 61.5)	51 (17.5)	0.000	1
Yes (182, 38.5)	102 (56.0)		6.00 (3.94–9.14)
Interpersonal relationship problem (n=473)*			
No (356, 75.3)	94 (26.4)	0.000	1
Yes (117, 24.7)	59 (50.4)		2.84 (1.84–4.37)
Satisfaction with academic performance (n=474)*			
No (232, 49.0)	104 (44.8)	0.000	1
Yes (242, 51.0)	49 (20.25)		0.31 (0.21–0.47)
Smoking (n=480)*			
No (416, 86.7)	122 (29.3)	0.003	1
Yes (64, 13.3)	31 (48.4)		2.26 (1.33–3.86)
Alcohol use (n=479)*			
No (364, 76.0)	105 (28.8)	0.000	1
Yes (115, 24.0)	48 (41.7)		1.77 (1.14–2.73)
Note.* - Missing responses were excluded from the total before percentages and OR was calculated.			

Materials

The questionnaire included:

- Items on socio-demographic and personal characteristics (age, sex, year in medical school, accommodation, part-time job, extracurricular activities, suicidal ideation, thoughts of dropping out, relationship problem with family and friends, satisfaction with academic performance, cigarette and alcohol use), and
- The Russian version of the Copenhagen Burnout Inventory adapted for students. The R-CBI-S consists of 25 items that represent four dimensions: Personal Burnout (PB) – 6 items (numbers 1, 2, 3, 4, 5, and 6), Studies-related Burnout (SRB) – 7 items (numbers 7, 8, 9, 10, 11, 12, and 13), Colleague-related Burnout (CRB) – 6 items (numbers 14, 15, 16, 17, 18, and 19), and Teacher-related Burnout (TRB) – 6 items (numbers 20, 21, 22, 23, 24, and 25). The answers that can be given to each item are “always,” “frequently,” “sometimes,” “rarely,” and “never.” The scores attributed to these answers are 100, 75, 50, 25, and 0% respectively, with inverse scoring for item 10. For each scale, it has calculated a total average score. According to Kristenson’s criteria of burn out levels scores of 50

to 74 are considered moderate, 75–99 are high, and a score of 100 is considered severe burnout (Borritz et al., 2006).

The study was approved by the Local Ethics Committee of AMU (extract from protocol No. 3 of September 20, 2018).

Data analysis

Data analysis was conducted using Microsoft Excel 2007, SPSS version 20.0, and Jamovi version 1.2.17. A statistically significant difference was accepted at a p-value of less than 5%.

Descriptive statistics were performed using mean and confidence intervals (95% CI) for quantitative variables. Percentages were computed for qualitative variables. We performed forward χ^2 -test and logistic regression to evaluate independent associations of the independent variables with burnout.

Results

The total R-CBI-S mean score was 39.96, and mean subscale scores for this sample were 52.62 (PB), 50.93 (SRB), 23.50 (CRB), and 32.77 (TRB). However, it is more important to study the overall prevalence of students reporting moderate, high, and severe burnout. On the PB subscale 40.99% of students reported moderate burnout, 15.56% reported high burnout, and 2.08% of participants scored 100 indicating severe personal burnout. The overall prevalence of students reporting moderate studies-related burnout was 35.93%. 18.93% of students reported high levels of burnout, and 0.78% severe studies-related burnout. On the CRB 9.47% of students reported moderate, 2.33% high and 0.91% severe. The prevalence of students reporting moderate TRB was 18.29%, while 4.93% of respondents reported high levels, and 1.94% reported severe TRB. The distribution of the burnout syndrome severity by total R-CBI-S scoring was as follows: No\Low – 72%, moderate – 25.4%, high – 2.5%, and severe – 0.1%.

A relationship testing by χ^2 -test (Table 2) reveals that the prevalence of PB was significantly higher ($p < 0.05$) in women and in students with an additional part-time job. Furthermore, students with extracurricular activities like participation in scientific clubs, student societies, and volunteering comparison to students without any activities show higher prevalence of CRB than their non-participant student counterparts. Participants with positive answers for the following questions had a significant more expressed burnout in total and for all dimensions: suicidal ideation, thoughts of dropping out, interpersonal relationship problems with family/friends, satisfaction with academic performance, and alcohol using. In addition, cigarettes smoking students were more prone to PB, SRB, and TRB.

Table 2. Prevalence of burnout by dimensions

Variables		PB	SRB	CRB	TRB
Gender	Male	49.2	50.3	14.5	29.0
	Female	61.8*	57.4	12.1	23.9
Part-time job	Yes	68.1	60.6	12.5	23.8
	No	55.6*	54.0	13.3	29.3
Extracurricular activities	Yes	56.2	54.5	16.7	26.4
	No	60.0	56.3	10.4*	24.4
Suicidal ideation	Yes	89.6	84.4	24.7	54.5
	No	47.7**	52.9**	10.1**	22.8**
Thoughts of dropping out	Yes	86.3	86.3	18.1	44.5
	No	48.8**	40.9**	8.9*	17.9**
Interpersonal relationship problem	Yes	83.8	70.9	22.2	43.6
	No	56.2**	53.9*	9.6**	23.0**
Satisfaction with academic performance	Yes	51.7	44.6	8.3	18.6
	No	75.0**	72.4**	17.2*	37.9**
Smoking	Yes	78.1	81.2	11.8	43.7
	No	59.9*	54.3**	17.2	25.2*
Alcohol use	Yes	69.6	67.0	19.1	37.4
	No	60.2*	55.2*	10.2*	24.7*
Total		58.6	55.6	12.7	25.2
Note.*p < 0.05, **p < 0.001, PB = personal burnout, SRB = studies-related burnout, CRB = colleague-related burnout, TRB = teacher-related burnout					

Dormitory students demonstrate lower personal (48.28 vs 54.38, $p < 0.05$), studies-related (45.23 vs 52.82, $p < 0.05$) and total burnout (36.31 vs 41.04, $p < 0.05$) than students living at home. Moreover, students living in a dormitory had a lower level of studies-related burnout compared to students who occupy non-student housing (45.23 vs 50.91, $p < 0.05$).

Students who reported entering medical school by their own choice were found to have significantly lower levels of burnout (37.8, 95% CI 36.6–39.1) than students who chose medical education for other reasons (49, 95% CI 42.8–55.3), including those for whom the decision to study medicine was made by their parents or other close relatives (48.5, 95% CI 45.4–51.5), $p < 0.001$.

In Table 1, logistic regression analysis revealed that seven variables were significantly associated with an increased likelihood of having burnout: being in one's second year of study (OR = 2.25, $p < 0.001$); living at home or in a rented dwelling (OR = 1.89 and 1.47 respectively), $p = 0.021$; having suicidal ideation (OR = 7.79, $P < 0.001$); having thoughts of dropping out (OR = 6, $p < 0.001$); having interpersonal relationship problems with family or friends (OR = 2.84, $p < 0.001$); smoking (OR = 2.26, $p = 0.003$); using alcohol (OR = 1.77, $p < 0.001$). Two variables were significantly associated with a decrease in burnout: enrolling in a medical university by one's own decision (OR = 0.18, $p < 0.001$); and expressing satisfaction with one's academic performance (OR = 0.31, $p < 0.001$).

Discussion

This study aimed to determine the prevalence of burnout and to identify factors associated with burnout among medical students at AMU. In one systematic review of 24 studies of 17,431 pre-residency medical students, overall burnout prevalence across the entire student population was estimated to be 44.2% (33.4%–55.0%) (Frajerman et al., 2019). In the current study prevalence of burnout syndrome was 28% (broken down by severity: 25.4% moderate, 2.5% high, and 0.1% severe). Similar medical student burnout rates were found in studies from South and Central America (26%) and Europe (27.5%).

Our study also revealed that while prevalence of burnout was not dependent on gender, women showed significantly higher scores of personal burnout ($p < 0.05$). In a systematic review, Frajerman et al. (2019) found no significant association between gender and burnout. In contrast, two systematic reviews of Chinese and Brazilian medical schools found higher levels of burnout in males (Chunming et al., 2017; Pacheco et al., 2017). The burnout prevalence among medical students was also different according to the year of study ($p < 0.001$); burnout rate were higher among students in the second year relative to students in the other years.

Many students during the training period take on additional work for various reasons: to make extra money or, try to improve their practical skills by working as junior medical personnel in clinics. Students doing additional work outside of the required curriculum represented 24% of our respondents. These students were found to have significantly higher prevalence of personal burnout ($P < 0.05$) compared to students who do not have any job.

Some prior research has found that burnout was not associated with different types of extracurricular activities (Fontana et al., 2020; Almalki et al., 2017). However, it is known that extracurricular activities like those involving music and physical exercise may reduce burnout and other mental health problems (Chang et al., 2012; Fares et al., 2016). In the current study, authors wanted to study the impact of extracurricular activities such as participating in scientific clubs and student societies and volunteering on burnout. We found that students with extracurricular activity had a higher level of colleague-related burnout comparison to students without it ($p < 0.05$).

Among US medical students Dyrbye and Shanafelt (2016) and Dyrbye et al. (2008) found that burnout can contribute to suicidal ideation, while recovery from burnout decreases the prevalence of suicidal

ideation. Data from the systematic review of Ishak et al.' (2013) pointed to an association between burnout in medical students and suicidal ideation. Our study found that students with suicidal ideation have more expressed burnout in total and across all studied dimensions ($p < 0.001$). Also, students who had suicidal ideation were almost eight (7.8) times more likely to develop burnout than those who did not have suicidal ideation.

Burnout is known to be associated with serious thoughts of dropping out (Dyrbye et al., 2010). In the current study we found the same association: students who report thoughts of dropping out from medical school show significantly higher burnout severity and prevalence ($p < 0.001$). Moreover, we found that students who are not satisfied with their academic performance have more pronounced burnout syndrome ($p < 0.001$). Suicidal ideation and thoughts of dropping out can be described as the manifestation of distress (Dyrbye et al., 2011).

Some authors report strong relations between stress and interpersonal relationship problems among medical students (Salam et al., 2015; Bhagat et al., 2018). Participants of current study indicated the presence of relationship problems with family and friends more prone to burnout.

Substance use seems to play a meaningful role in burnout. 64 out of 480 students (13%) in the present study indicated that they smoke cigarettes. The study found that these students had higher burnout prevalence. Results obtained by Cecil, et al. (2014) indicated that being an ex-smoker was significantly predictive of higher emotional exhaustion scores. Also, a study from Japan concluded that the mental health status of dental students among regular smokers was better than that of non-current smokers (Fujita & Maki, 2018). One longitudinal survey among German and Chinese students showed healthy lifestyle choices like choosing not to smoke are related to improvements in mental health over a one-year period (Velten et al., 2018). On the other hand, a study from South-West Ethiopia indicates that smoking cigarettes was significantly associated with common mental disorders (Kerebih et al., 2017). Alcohol use is also of note in the burnout research. Jackson et al. (2016) found that alcohol abuse or dependence was more common among medical students with burnout, high emotional exhaustion, and high levels of depersonalization. Research among British medical students did not find significant correlations between any of the personality variables and alcohol consumption (Ashton and Kamali, 1995). Cecil et al. (2014) reported that increased alcohol binge scores were significantly associated with higher personal accomplishment scores. In this study, we found that higher burnout prevalence is found in students who drink alcohol ($p < 0.001$).

The degree to which students feel to have been empowered to make their own decisions regarding studies and career also seems to influence susceptibility to burnout. We note that the culture of Kazakhstan is distinct from that of more individualistic nations' cultures that heavily promote independence and autonomy of young adults in that it is common for younger generations to strictly obey and yield to the opinions of older relatives. This influence often extends to decisions about which specialty children should pursue at university. In this work, it was found that when admission to a medical school is the decision of the student him/herself, or that he/she believes that it was, then during

the study period, the student is likely to reported significantly lower levels of burnout ($p < 0.05$) than student counterparts who chose medical education for other reasons, including the urging of parents and close relatives. Thus we determined that an independent decision of the student to enter a medical school was a strong predictor for burnout development.

Finally, dwelling type plays a meaningful role. We found that compared to medical students who were not burned out, those who screened positive for burnout were more likely to be living at home or rented a house than in student housing. This might suggest there compounding network effects of burnout – that students living among other students might inherit be more likely to burn out themselves. It might also suggest that those living in non-student housing are more likely to have stronger support systems – family, relationship partners, or friends close enough to live with – that function as a burnout preventative.

Conclusion

Based on the findings presented in this article, it is clear that there is a high prevalence of burnout syndrome among medical students, in a population of Kazakh medical students. There was a significant association between the existence of burnout and student's year of study, accommodation, design to study in medical school, suicidal ideation, thoughts of dropping out, interpersonal relationship problems, satisfaction with academic performance, smoking, and alcohol use. Longitudinal studies are required to further explore and elucidate the patterns of burnout among medical students.

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Figures

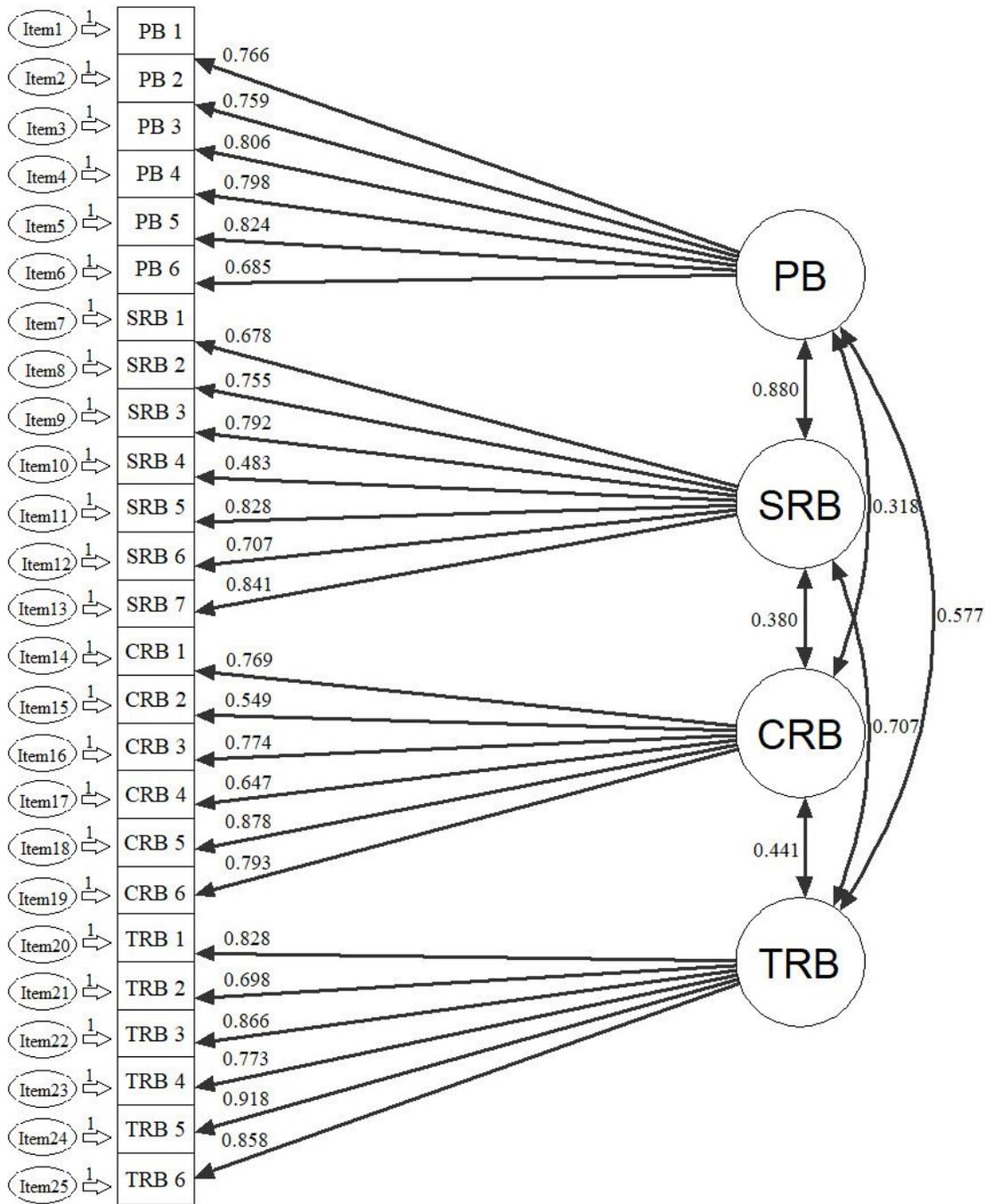


Figure 1

Confirmatory Factor Analysis of the Russian Version of the Copenhagen Burnout Inventory - Student Survey (R-CBI-S) [$\chi^2/df = 3.881$; CFI = 0.940; TLI = 0.933; RMSEA = 0.0611]

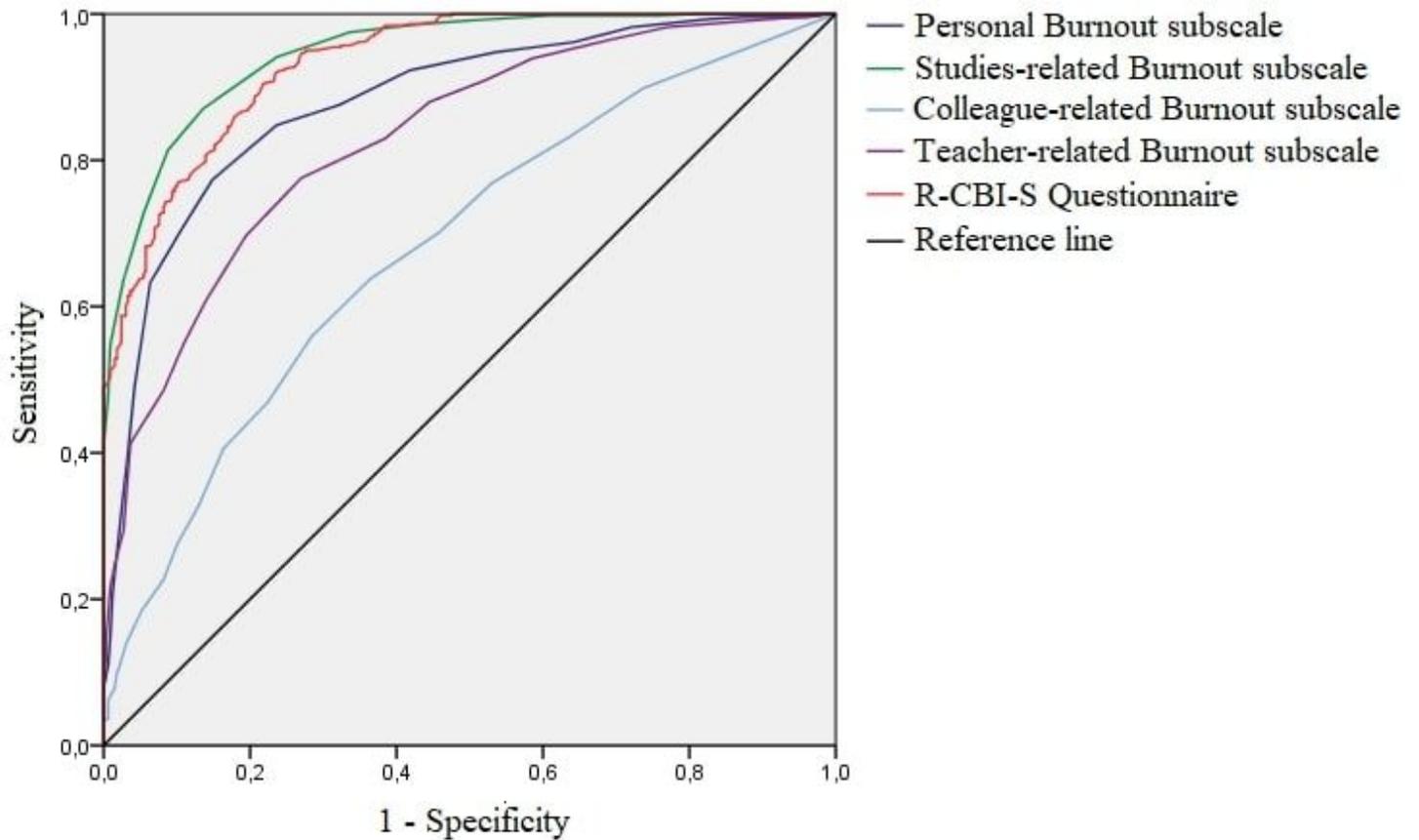


Figure 2

Receiver operating characteristic (ROC) of the Russian version of the Copenhagen Burnout Inventory - Student Survey (R-CBI-S).

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