ORIGINAL ARTICLE

Psychosomatic distress symptoms among international students in Germany: Role of academic stress and socio-demographic factors

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Abstract

Objectives: To assess the predictive role of academic stress in anxiety, depression and somatisation among international students in Germany, and to explore if socio-demographic factors were of any significance in this regard.

Method: The cross-sectional study was conducted from October 2017 to March 2018 in Germany and comprised students at universities offering programmes in the general subject category and had a strength of 1000 international students. Data was collected using the Student Stress Inventory, Beck Anxiety Inventory, Major Depression Inventory, Pennebaker Inventory of Limbic Languidness and a socio-demographic questionnaire. Data was collected online, and was analysed using SPSS 21.

Results: Of the 557 subjects, 261(46.9%) were males. The overall mean age of the sample was 25.77±3.79 years. Academic stress explained a great degree of variance in distress symptoms ($p<0.05$), while socio-demographic variables, except gender, were less important ($p>0.05$). Male students had a lower level of anxiety, depression, and somatisation ($p<0.05$). Age was inversely related to anxiety and somatisation ($p<0.05$).

Conclusion: There was a clear need to address the problems of higher level of psychological and somatic distress among international students.

Keywords: Anxiety, Depression, Somatisation, Academic stress, International students. (JPMA 70: 1119; 2020)

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Introduction

International students studying abroad often face a variety of academic challenges that can be a source of significant concern.[1] Issues involving acclimatisation to unfamiliar study techniques, testing methods and classroom instructions are most commonly reported.[2] This form of academic stress manifests as a limitation of the individual to adapt to the variety of academic demands.[3] These academic demands can include, but are not limited to, exposure to new concepts, both academic and social, as well as a considerably larger workload.[4] Existing research suggests that a number of academic demands determine academic stress, including course requirements, meeting deadlines, examinations, time management issues, financial burdens, interactions with faculty, personal goals, social activities, adjustment to the campus environment, lack of support networks, and career choices.[5] What remains unknown in literature is the level of academic stress experienced by international students and its connection with distress symptoms.

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Psychological distress is an unpleasant subjective state, which takes two major forms: depression and anxiety. Mesidor and Sly found that depression and anxiety are common psychological problems experienced by international students in the United States.[6] In another study conducted on graduate and professional students, approximately 35% graduate students reported depressive symptoms.[7] Many individuals who suffer from stress experience physical complaints, such as headaches, insomnia and gastrointestinal problems often labelled as "medically unexplained physical symptoms". Somatisation is an important component of stress response which has been ignored in research. A study assessing psychological distress among students in Germany identified depression, exam anxiety and psychosomatic symptoms as the most common concerns in a selected sample of students who consulted a counselling centre.[8] However, the percentage of depression, anxiety and somatic symptoms in the general student sample remained unexplored. Studying psychological and somatic distress among international students can reveal the extent to which their psychological state is affected by living and studying far from home in a different country. Although the level of academic stress and subsequent distress symptoms vary greatly, depending on student's sense of purpose and motivation as well as the relative standards demanded by

the universities, individual demographic characteristics and socio-cultural background factors also play an important role in this context.

The current study was planned to assess the predictive role of academic stress in anxiety, depression and somatisation among international students in Germany, and to explore if socio-demographic factors were of any significance in this regard.

The hypothesis tested was: Academic stress is a significant predictor of psychological distress symptoms, including anxiety, depression and somatisation, among international students.

Subjects and Methods

The cross-sectional study was conducted from October 2017 to March 2018 in Germany and comprised students at universities offering programmes in the general subject category and had a strength of 1000 international students. The sample was raised using purposive sampling. Those included were subjects of either gender aged 20-35 years who were studying Bachelors, Masters/Diploma or Doctoral studies in different German universities. Their length of residence in the host country had to range between 4 weeks to 4 years. Professional degree students were not included. The sample was comprehensively diverse with representation from Asia, Africa, Latin America and Europe. Asian countries included China, Pakistan, Indonesia, India, Iran and Thailand. Cameroon, Kenya, Ethiopia, Ghana and Egypt represented African countries. Students from Latin America mostly belonged to Brazil, Mexico, Colombia, Chile, Argentina and Costa Rica. European students were mainly from France, Italy, Romania, Spain, Bulgaria, Poland and Ukraine.

This study followed the statistical expert's advice suggesting the sample size to be several times (preferably 10 times or more) as large as the number of variables in multivariate study (including multiple regression analysis).[9] Thus the sample size of the current study was kept large enough to run the desired analysis.

The recruitment of participants was facilitated by the student affairs offices of the respective universities. They were asked to disseminate a standard advertisement in the form of an email for participation in the study to the target population. The contents of the email provided a brief overview of the study as well as an eligibility criteria and contact information. This information was sent to all enrolled international students in the selected universities. A link to a survey website was provided that was maintained for a period of 4 months.

Ethical approval for the study was taken from institutional ethical review committee. Informed consent was taken from all the participants. Their participation was completely voluntary, and the participants were assured of their anonymity, confidentiality of their responses, and their right to withdraw at any point during the study. Participants were also informed of the opportunity to win monetary incentives to the extent of 50 Euros, 30 Euros, and 20 Euros, on the basis of a lucky draw comprising valid email addresses at the end of the survey. The first section of the questionnaire package requested information about age, gender, marital status, current educational degree, subject of study, major source of financial support, home country, continent of origin, prior travelling experience abroad, and the time they had spent in the host country. The whole set of questions (all in the English language) could be filled in 15-20 minutes. Since the sample had huge variability regarding the home/native language, English was the only common language which is widely spoken and understood particularly within the educational setting. Further data was collected using Beck Anxiety Inventory (BAI), Major Depression Inventory (MDI), Pennebaker Inventory of Limbic Languidness (PILL) and Student Stress Inventory (SSI). The BAI[10] is a self-reporting measure of anxiety, with 21 items assessing the various symptoms associated with the condition. Assessment involves the respondent ranking each symptom experienced on a 4-point scale of intensity within the preceding week. The items are subsequently totalled for a score of anxiety level in the 0-63 range. The scoring guidelines label scores between 0-7 as 'Minimal', 8-15 as 'Mild', 16-25 as 'Moderate', and 26-63 as 'Severe'.[11] The inventory has also been extensively validated and demonstrates optimal reliability with a variety of samples.[11]

The MDI[12] is a brief, 10-item self-reporting measure of depression, assessed using a 6-point Likert scale that rates the presence of symptoms during the preceding 14 days. The rating scale itself measures the symptoms on a spectrum of 'at no time' (0) to 'all the time' (5). The score is summed up to indicate the severity of depression between a possible 0-50 range, with 0 indicating 'no depression' and 50 representing 'severe depression'. Additional ranges within the scale represent 'Mild depression' (20-24), 'Moderate depression' (25-29), and 'Severe depression' >30.13 The convergent validity of the inventory is well-established.[13]

The PILL[14] is a self-reporting inventory that assess the frequency with which common physical symptoms are experienced, with each of the 54 items measuring the frequency on any one type of sensation. A 5-point Likert

scale is utilised to assess the range from a possible 'Never experienced the symptoms' (0) to a 'More than once per week' (4). The total score is calculated by summing all scores on the items. The inventory has a Cronbach's alpha range 0.88-0.91 with a reliability (test-retest, 2-month) ranging from 0.79 to 0.83.[14]

Pre-testing demonstrated that 9 items in the PILL had sub-optimal item-total correlation, at <0.35, which were removed from the test. Additionally, since PILL and BAI have similar items, a correlation was also conducted among them. The 18 items that correlated highly at r>0.35 were also removed. The 28 items left had an appropriate Cronbach's alpha value of 0.88.

Academic stress was measured by SSI[15] which originally comprises 53 items. It is a 5-point Likert type scale, where 1 is 'not at all stressful' and 5 is 'extremely stressful'. The present study used 31 items, which were related directly to the academic life setting. Items included stressors like academic exams, overload of regular assignments, presenting oral reports before class, assimilating new study material, competitive academic atmosphere, and meeting deadlines etc. The scale provides a sum score for total academic stress, with higher scores indicating greater academic stress. Cronbach's alpha ranged from 0.92 to 0.94 among a sample of college students.[15] On the basis of the results of pre-testing, five items of SSI having low item-total correlation (r<0.35) were deleted without losing reliability. The remaining 26 items had a Cronbach's alpha coefficient of 0.92.

Host language proficiency for day-to-day communication and academic purposes was assessed using 5 items. Each item was rated on a 5-point scale (1 = very uncomfortable/incompetent to 5 = very comfortable/ competent) based on the perception of the participant. The raw score ranged from 5 to 25 with a high score indicating high proficiency.

Data was analysed using SPSS 21. Multiple linear regression (MLR) analysis was carried out to find out the role of academic stress and socio-demographic factors in predicting anxiety, depression, and somatisation among the students. MLR comprised three separate analyses run using the same procedure. Variable input was carried out in three blocks utilising the enter method. Of these blocks, general demographic variables such as age, gender, marital status, educational status, subject of study, and major source of financial support were included in the first block. Variables which make these students, being international, distinct from other students were entered in the model as the second block. These included continent of origin, German language proficiency, time spent in Germany and a prior inter-culture travelling experience. Having the first two blocks of variables in the model, academic stress was entered in the model as the third block. An alpha level of 0.05 was used for all analyses.

Results

Of the 557 subjects, 261(46.9%) were males. The overall mean age of the sample was 25.77±3.79 years (Table-1).

A quantitative analysis was conducted on all the study variables and outcome was noted (Table-2).

MLR showed significant predictors of anxiety in the three blocks, showing high levels of anxiety associated with high levels of academic stress (Table-3).

Concerning depression, females' gender and loan as the source of financial support were predictive factors (p<0.05). Host language proficiency meant low level of depression (p<0.01). Longer duration of stay led to higher depression (p<0.05). However, host language proficiency and time spent in host country lost their predictive power

Table-1: Demographic characteristics of the sample (N = 557).

Demographic variables	Categories	International students M (SD), n, (%)
Age (years)	Range 20-35	M 25.77, SD 3.79
Gender	Men	261 (46.9)
	Women	296 (53.1)
Marital status	Living alone	397 (71.27%)
	Living with partner/married	160 (28.73%)
Educational status	Bachelors	105 (18.9)
	Diploma	52 (9.4)
	Masters	236 (42.3)
	Doctorate	164 (29.4)
Subject of study	Natural sciences	226 (40.5)
	Social sciences	92 (16.5)
	Humanities	80 (14.4)
	Business	159 (28.5)
Continent of origin	Asia	237 (42.6)
	Africa	30 (5.4)
	Latin America	98 (17.5)
	Europe	192 (34.5)
Source of financial support	Scholarship/Funding	245 (43.9)
	Parents/Family	120 (21.5)
	Personal earning	32 (5.8)
	Loan	9 (1.7)
	Savings	6 (1.2)
	Others	145 (25.9)
Time spent in the host country (months)	Range 1-48 months	M 21.35, SD 16.53
Prior travelling experience	Yes	387 (69.48%)
	No	170 (30.52%)

M: Mean; SD: Standard deviation.

Table-2: Summary of the variable means, standard deviations, distribution, and correlations (N = 557).

S.No	Variables	a	M	SD	Skew	Std.error	Kurtosis	Std.error	K-S	II	III	IV
1	Academic stress	.91	82.62	13.4	-.28	.10	.24	.20	.06**	.48**	.44**	.38**
2	Anxiety	.91	18.96	11.2	.90	.10	.63	.20	.10**	-	.64**	.67**
3	Depression	.90	18.60	10.6	.79	.10	-.04	.21	.12**		-	.53**
4	Somatisation	.92	25.27	16.3	1.1	.11	1.2	.21	.09**			-

**p < .01. Note. K-S: Kolmogorov-Smirnov test. M: Mean; SD: Standard deviation.

Table-3: Multiple regression predicting anxiety, depression, and somatisation among international students.

	Anxiety			Depression			Somatisation		
Predictor Variables	**Block I**	**Block II**	**Block III**	**Block I**	**Block II**	**Block III**	**Block I**	**Block II**	**Block III**
	β	β	β	β	β	β	β	β	β
Block I									
Age	-.02	-.13*	-.09	.03	-.07	-.04	-.07	-.12*	-.10
Gender	-.15**	-.15**	-.10*	-.15**	-.14**	-.10**	-.18***	-.18***	-.13**
Marital status	.08	.09	.05	.01	.01	-.02	.05	.05	.03
Subject of study									
Social sciences	-.08	-.07	-.05	-.05	-.01	-.01	-.01	-.01	.02
Humanities	-.04	.01	.01	-.05	.01	.01	.05	.08	.09
Business	-.04	-.01	.01	-.04	-.01	-.01	.05	.06	.07
Degree									
Diploma	-.01	-.01	.03	-.01	-.01	.03	-.03	-.03	.01
Masters	-.06	-.02	.03	-.04	-.02	.03	-.07	-.06	-.02
Doctorate	-.07	-.03	.10	-.09	-.08	.02	-.04	-.04	.05
Financial support									
Parents	-.05	-.05	-.06	.01	-.01	-.01	-.01	-.01	-.01
Personal earning	.02	.01	-.01	.01	-.02	-.03	.04	.03	.02
Loan	.01	.01	.03	.06	.06	.09*	.03	.02	.04
Saving	.08	.01	.07	-.01	-.01	-.01	.06	.06	.06
Others	.05	.04	.02	.08*	.08	.06	.04	.03	.02
Block II									
Continent of origin									
Asia	-	-.01	.03	-	-.01	.03	-	-.04	.01
Africa	-	.11*	.11*	-	.03	.03	-	.01	.01
Latin America	-	.12*	.12*	-	.06	.06	-	.05	.05
Host Language proficiency	-	-.07	.01	-	-.15**	-.08	-	-.11*	-.04
Time in host country (months)	-	.13*	.05	-	.16**	.09	-	.09	.04
Prior Travelling experience	-	-.06	-.04	-	-.03	-.01	-	.01	.03
Block III									
Academic Stress	-	-	.46***	-	-	.39***	-	-	.35***
R^2	.02	.04	.23	.01	.02	.16	.03	.04	.15
F	1.57	2.03**	8.69***	1.36	1.70*	6.29***	2.41**	2.07**	5.71***
df	14, 522	20, 516	21, 515	14, 522	20, 516	21, 515	14, 522	20, 516	21, 515

*p < .05, **p < .01, ***p < .001.

Note. Female was coded as 0 whereas male was coded as 1 and concerning marital status living alone was coded as 0 and living with a partner/married was coded as 1. For degree, bachelor studies served as a reference group, for subject of study natural science, for sources of financial support scholarship, and for continent of origin Europe served as a reference group. For prior travelling experience, 'no' was coded as 0 and 'yes' was coded as 1.

when academic stress was added in the model. Academic stress was relatively a strong predictor of depression among international students ($p<0.001$).

Age and female gender were significant predictors of somatisation ($p<0.05$), while better language proficiency was predictive of lower somatisation symptoms ($p<0.05$). Age and host language proficiency lost their predictive power once academic stress was entered in the model. Academic stress was relatively a stronger predictor of somatisation ($p<0.001$), showing high academic stress predicted high level of somatisation.

Discussion

As hypothesised, the current study supported the assertion that academic stress is a significant predictor of psychosomatic distress among international students. The symptoms included anxiety, depression and somatisation. It also presented support in favour of the claim that academic stress may negatively impact health outcomes, both psychological and somatic, in international students.[16] Increased academic stress plays a role in not only elevated depression, but also compromised emotional health, and a low level of positive affect which in turn can negatively affect academic performance, thus increasing academic stress and perpetuating a cycle of stress, maladaptive coping, and compromised health.[17]

Among socio-demographic variables, gender was a significant predictor of all distress symptoms, as male students had a lower level of anxiety, depression, and somatisation. An interesting finding is the robust role gender plays in the psychological distress and somatic symptoms of the students.[18] Although the reasons for this difference are not fully known, it can be speculated that a combination of various factors predispose women towards higher distress, including gender-related biological factors, neurotransmitters and hormones, and additional psychosocial factors related to gender.[19] Another factor could be the socialisation of the genders and its influence on frequency of reported symptoms.

Age was inversely related to anxiety and somatisation among international students, showing high level of anxiety and somatisation among participants who were comparatively younger. Assuming that older students may be more mature and have acquired better coping skills over a period of time, one could tentatively expect lower level of distress symptoms among older students. However, this finding is contrary to previous research which found that old age is associated with higher level of anxiety.[20]

Continent of origin was a significant predictive factor of anxiety among international students. Students who belonged to Africa or Latin America had a higher level of anxiety compared to students having European background. It has been demonstrated that the levels of stress and anxiety increase proportionately to the degree of difference between the home and host cultures. This claim is supported by the low levels of stress and anxiety in European students since their adjustment rate to host society is superior due to a greater similarity in cultures.[21] Contrary to this, students from African and Latin American countries tend to be different from the host society with respect to their fundamental cultural values which makes them more vulnerable to experience adjustment related difficulties and stress.

Time duration spent in the host country was a significant predictor of anxiety and depression among international students. The high level of anxiety and depression may be attributable to the experience of discrimination, homesickness, and perceived rejection among international students who stay longer in the host country.[21]

Host language proficiency was another significant predictive factor of depression and somatisation among international students, showing high proficiency linked with lower level of depression as well as somatisation. This finding is consistent with previous research which showed an inverse relationship between self-reported host language proficiency and level of depression.[22] Adequate language proficiency enhances the chances of social interaction and active participation in class.

Financial support through loan, sometimes received from the home government, was associated with higher level of depression among international students. The anticipation of payment of huge debts is worrisome for students.

The present study has few limitations. Firstly, data of the study is self-reported in nature. Some biases could exist on the part of the respondents, including social desirability and errors in recall. Secondly, the survey was conducted in English language and students had varying language competence. There is a possibility that observed differences are to some extent determined by linguistic and not the psychological factors. Lastly, the current research did not distinguish between the types of international students being studied. The experiences of short-term (exchange) international students and students studying abroad for the duration of their degree programme may differ to a certain extent. Despite the limitations, the current study has practical implications for educators, counsellors and medical practitioners.

Departments of student affairs of universities and student service organisations may benefit from the finding of the present study. Stress management training will be effective in helping students manage academic stress and related psychosomatic problems. However, one needs to be careful in generalising the research findings. Future studies with randomly selected samples would build more confidence in the patterns of findings seen in the current study.

Conclusion

Academic stress was found to be a risk factor for having a higher level of psychological as well as somatic distress among international students. Mastering a new educational system was linked with alleviated anxiety, depression and somatisation.

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