EVALUATION OF RISK FACTORS ASSOCIATED WITH DEPRESSION AMONG INDIAN AND ARMENIAN MEDICAL STUDENTS AT YEREVAN STATE MEDICAL UNIVERSITY: A CROSS- SECTIONAL STUDY

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Abstract

Background: Medical education can be quite stressful. Studies have shown a high prevalence of depression among medical students. Psychological disorders on a personal level can contribute to substance abuse, broken relationships, suicide and attrition from the profession subsequently affecting students' care of patients, relationship with faculty and ultimately the culture of the medical profession. The mental health of foreign students in Armenia whose number increased since late 90s has never been evaluated.

Objective: This study evaluated the association of migrational, social and cultural factors with the presence of depressive symptoms among medical students.

Methods: A cross-sectional anonymous questionnaire was administered to Indian and Armenian students enrolled in the general medicine faculty at Yerevan State Medical University (YSMU) in Armenia. Elements from the Center for Epidemiologic Studies-Depression (CES-D) scale were used to assess depressive symptoms. Components from daily hassle, perceived medical stress and social readjustment scale are included in addition to questions regarding social/demographic variables.

Results: The final sample included 388 students; 191 Indian and 197 Armenian medical students. The prevalence rate of probable depression was higher among Indian students compared to their Armenian peers (50.8% vs. 27.9%). After adjusting for confounders, the study identified potential risk factors associated with the development of probable depression that included female gender (OR = 1.71; p = 0.04), high perceived medical school stress scale(OR=1.16, p = 0.00) and high daily hassles scale scores(OR =1.25, p =0.00).

Conclusion: The study findings identified the key risk factors involved in the development of depression in medical students and can guide the design of targeted interventions that reduce the likelihood of depression via mentoring, wellness and mental health programs.

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List of Acronyms

YSMU: Yerevan State Medical University

CES-D: Center for Epidemiologic Studies-Depression scale

SPSS: Statistical Package for the Social Sciences

IRB: The Institutional Review Board

CHS: College of Health Sciences

AUA: American University of Armenia

DSM – IV: Diagnostic and Statistical Manual of Mental Disorders (DSM-IV)

ICD: International Classification of Diseases

PMSS: Perceived medical school stress

SRRS: Social readjustment rating scale

DHS: Daily hassle scale

MDD: Major Depressive Disorder

VIF: Variance Inflation Factor

1. Introduction

Depression is a common mental disorder worldwide.[1] It is a mood disorder characterized by an inexplicable, enduring feeling of sadness (loss of positive affect) that affects daily activities.[1–3] Depression is manifested through a plethora of symptoms that range from physical to psychological and can be extremely subjective.

The Fourth Edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) developed by the American Psychiatric Association is commonly used for the diagnosis of depression. According to DSM-IV, at least five of the seven depression symptoms should be present during the same two-week period to diagnose depression.[2] The seven symptoms include 'depressed mood, diminished interest or pleasure in activities, significant appetite, weight loss or gain, insomnia, hypersomnia, feelings of worthlessness, excessive guilt, diminished ability to think or concentrate, recurrent thoughts of death or suicide'.

The Tenth Edition of the International Classification of Diseases describes the symptoms of depression as persistent sadness or low mood, and/or loss of interests or pleasure fatigue or low energy at least one of these, most days, most of the time for at least two weeks.[3] Associated symptoms like disturbed sleep, poor concentration or indecisiveness, low self-confidence, poor or increased appetite, suicidal thoughts or acts agitation, slowing of movements and guilt or self-blame can be present too. The ten symptoms then define the degree of depression and management is based on the particular degree; 'not depressed (fewer than four symptoms), mild depression (four symptoms), moderate depression (five to six symptoms), severe depression (seven or more symptoms, with or without psychotic symptoms)'. These symptoms should be present for a month or more and every symptom

should be present for most of every day.[3]

Depression is a serious illness that should not be ignored. It should be treated like any other disease that requires medical attention.[4]The disorder can begin at any age and the symptoms are usually found to manifest during teenage;[4] it can occur as a single episode, or as ongoing condition with periods of 'relapse' and 'remission'.[4]

1.1Disease burden, diagnosis, prognosis and life time course

The global burden of depression poses a substantial public health challenge affecting 350 million people worldwide.[1] Currently it is the leading cause of disability in terms of total years lost.[15] Depression is almost twice as prevalent among women than men; in fact it is known to be one of the primary factors causing disability among women living in resource-constrained low and lower-middle income countries. Depression significantly increases the risk of committing suicide.[67] Major Depressive Disorder (MDD) is the psychiatric diagnosis most commonly associated with completed suicide.[8] Three thousand deaths occur every day owing to suicide, which accounts for around 1 million lost lives per annum. At least 20 other people may attempt to end their life for each suicide completed successfully.[8] Surviving family members not only suffer the loss of the loved one, but are also themselves at higher risk for suicide and emotional problems. Patients with depression also have higher chances of developing cardiovascular diseases than the general population. Depression in people 65 and older increases the risk of stroke and other medical complications.[9]

Depression mars intellectual and social behaviors leading to diminished performance in daily activities.[10] It poses financial loss to the individual alone at the beginning, then the family, their employers and eventually the society as a whole. According to the National Co morbidity Survey Replication, 'an average of over 27 workdays per year was lost per

depressed employee representing an annual individual loss of US$4400. At a national level, this translates into a loss of US$36.6 billion per year in the US'.[11]

Studies on different subsets of the Armenian population (earthquake survivors,[12] geriatric population[13])and several household surveys suggest that depression is highly prevalent in Armenia. Several surveys were conducted in Armavir marz[14]and Sevan[15] between 2000 and 2006 using the Center for Epidemiologic Studies-Depression scale (CES-D). Relatively high CES-D scores were reported among Armenians; the lowest, 15.55 (SD 9.02), was reported among men in 2006 and the highest, 23.92 (SD 9.75), among women in 2001.[14–16]

Depression affects the individual in multiple ways, even after successful treatment and remission is achieved. The symptoms never disappear completely.[10,17]

1.2 Risk factors

Several complex factors that are interactive place an individual at risk for depression. Research shows that depression is a complex phenomenon. Biological, genetic, psychological and environmental factors have been investigated and found to be linked to the experience of depressive episodes. Situational factors can contribute in an alarming way to deteriorating the mental health of an already depressed person or precipitate the symptoms. For example, exposure to violence, deficiency of care and guidance, anxiety, chronic illnesses, poor socio economic conditions[17,18]legal difficulties, separation from loved ones or divorce[12] and genetics [12] can either present as the symptom itself or aggravate the underlying condition.

Gender is one of the major risk factor that predisposes mankind to this disorder. Depression affects both genders, but epidemiological studies consistently report that women in general tend to be more vulnerable to depression than men.[19–23] It is reported that in any given year more women are likely to be diagnosed with depression.[24] Factors unique to women such as biological and hormonal changes may predispose them to this disorder more

so than men.[21] Balancing their career along with home responsibilities, caring for children and aging parents may trigger a depressive episode. Women respond differently to these events. In fact, women respond in such a way that prolongs their feelings of stress more so than men, increasing the risk for depression.[21] Also women are less hesitant than men to seek help, which can explain the higher diagnosis rate.[22]

Another risk factor is the genetic constitution of an individual. Genetics research indicates that the risk for developing depression likely involves the combination of multiple genes with environmental or other factors.[25]

Considerable heterogeneity can be found about the prevalence of depression among migrants in the international studies depending on the study population and methodology with a wide range of prevalence rates from 3% up to over 80%.[26] Even then it can be safely concluded that acculturation[27–30] poses an elevated risk for the onset of depressive symptoms or disorder in migrants. Previous studies have identified various stressors associated with adaptation, which contribute to depressive symptoms such as racial/ethnic discrimination based on language barriers[31,32] and cultural factors.[29,33–37] Youth often respond to the language barrier by remaining silent, appearing withdrawn, mood and fearful. This common response can last from one to two years.[37]

Poor financial circumstances and social isolation too make up the background conditions that can have consequences on the mental health in migrants.[31,32,38] Research has shown that lack of social support is significantly associated with increased depressive symptoms.[27,36]

1.3 Depression among medical professionals, medical students and international medical students

Psychological wellbeing is essential for medical students, for the patients they meet and for their future medical practice.[39–41] Psychological distress among physicians can significantly affect integral aspects of patient care; resulting in poor communication, diminished quality of care and medical errors.[42,43]

The emotional status of medical students during training has been a source of concern as early as 1956,[44] A concerning increase in depression can be noticed among medical students, residents, and physicians than in the general population, though estimates of its prevalence vary.[45–47] Several studies report that medical students, interns and residents experience higher level of depression than the general population.[20,48–50] Medical students experience depression, burnout, and mental illness at a higher rate than the general population, with mental health deteriorating over the course of medical training.[18,45,51–53] Medical students have a higher risk of suicidal ideation,[54,55] suicide[8,56] higher rates of burnout[52,57–59] and a lower quality of life than age-matched populations.[46,60] Burnout and depressive symptoms have been associated with suicidal ideation.[18,54,59,61]

Medical students are less likely than the general population to receive appropriate treatment despite seemingly better access to care.[62–64] Many do not seek help because their symptoms are not recognized as depression, depressed people are often seen as weak, the social stigma attached to mental illness causes them to avoid needed treatment.[51,64–66]Lack of confidentiality and fear of documentation could be other reasons for avoiding treatment.[51] Students may engage in potentially harmful coping methods such as excessive alcohol consumption and, despite their training, may fail to recognize that depression is a significant illness that requires treatment.[63]

Left untreated this condition may even lead to loss of productivity, poor quality of

health care provided and at worst suicide among doctors though they have easy access to health care.[67,68]

1.4 Indian medical students in Armenia

The Republic of Armenia is a landlocked, mountainous country in the South Caucus region of Eurasia.[69] Armenia is a lower middle income country[70] with a population of 3. 2 million[69] Armenia is an extremely homogenous country as most of the people are ethnic Armenians.[71] The official language is Armenian; nearly everyone in Armenia speaks this language natively, although Russian is a common second language.[71] The official religion is Christianity.[71] Armenia underwent major transitions politically, socially and economically in terms of becoming a market economy from the Soviet system and was subject to a series of catastrophes (earthquake of 1988 and the armed conflict in Karabagh).[69] More than 60 percent of Armenians live in urban areas; more than one third of the population resides in Yerevan.[69]

Yerevan State Medical University (YSMU) is the oldest medical university in Armenia.[72] Indian students have been coming to Armenia since 1992 to study medicine at YSMU.[72] Their numbers have increased dramatically since the start of the YSMU English faculty in 2000.[72] YSMU imparts education to Armenians and foreign students of whom Indian students are a majority along with a scattering of Iranians, Russians, Sri Lankans and Lebanese.[73] Currently, about 2000 Armenian and 500 Indian students study medicine at YSMU[73]

Indians students come from a unique multi-cultural, multilingual and multi religious background; the customs vary drastically from place to place even within the country. Although Hindi and English are the two official languages of India, followed by Bengali, Telugu, Marathi, Tamil and Urdu,[74] there are as many as 1,652 dialectical variations.[74]

Hinduism is the dominant religion of India, where more than 80% of the population is Hindu.[74] Islam is practiced by around 13% of all Indians.[74] The country has over 23 million Christians, over 19 million Sikhs, about 8 million Buddhists and about 4 million Jains.[74] A study of Asian American students found that they have higher parental expectations than Caucasian students, and a significant correlation existed between depressive symptoms and concern about making mistakes, perceived criticism from parents, and self- doubt.[75] Culturally prescribed female roles and lack of continued financial and emotional support from spouses and other family members were influential factors in depression among Asian Indian women.[76]

The YSMU Indian medical students come to Armenia in their late teens. Having an immigrant background has been identified as a risk factor for lower mental health like depressive symptoms in immigrant adolescents.[77,78] Adolescence is a demanding period in life; youth, especially girls are vulnerable to emotional problems like depression during this phase.[79,80] The students undergo changes in sleeping and eating habits; are exposed to the dry continental weather with heavy snowfall in winters as compared to the tropical monsoon climate, which prevails in India.[81,82] They adapt a different style of dressing suited to the new environment and this transition is more for girls. Religion, family solidarity and differential roles associated with age and gender makes up the context for thoughts and behaviors associated with depression along with the other factors unique to the culture and acculturation.

The role of social and cultural factors is paramount in both the etiology and the management of the psychiatric illness.[34,35,83] Different psychiatric disorders are under recognized yet common and treatable among medical students.[51,64,66] Various previous studies have shown that medical students are subjected to considerable stress over the last

decades.[45] Mental distress during medical school predicts later problems in physicians, which in addition to the personal suffering of the individual doctor might negatively affect patient care.[39,41–43,84]

1.5 Rationale of the study

To date, no studies in Armenia have evaluated the mental health of the medical students. Little is known about the training experience of foreign and local medical students. The aim of this study was to evaluate the prevalence of depressive symptoms among Indian and local Armenian students, the patterns of symptoms across the six years of training and whether they are influenced by the risk factors relevant to the students. These results would inform the symptoms and risk factors involved in the depression in medical students and could assist in the development of specific target programs (like mentoring, wellness and mental health programs), thus helping professors and medical educators to identify students at risk in each year of education or level of training. The results can reduce the impact of any disturbances in attitudes and behavior, which are essential to build a foundation for the development of physicians who will be better able to serve patients by first taking care of themselves.

1.6 Study Objectives

The study had the following three objectives:

a) Estimate the prevalence of depression among the Armenian and Indian medical students at YSMU.
b) Assess the associations between year of study, gender and migration- related social and cultural factors with depression among the medical students of YSMU.
c) Assess the difference in risk factors for developing depressive symptoms among the Indian and Armenian medical students of YSMU.

2. Methods

2.1 Study Design, population and setting

The study utilized a cross-sectional design and was conducted at YSMU, Yerevan, Armenia. The study target population consisted of two groups, namely, Indian medical students and local Armenian medical students, all studying General Medicine.

2.2 Sample size & sampling

The depression prevalence for local Armenian medical students in YSMU was assumed to be 13.6%, based on an anonymous multisite (six different medical universities in the United States of America (U.S.A) study conducted among 'medical trainees (medical students and residents)' of diverse ethnicity that included 29.5% Caucasians (n =648) and 5.6% Asians.[60] Comparing depression prevalence between Indian medical students and Armenian students in YSMU, the odds ratio for depression prevalence was assumed to be 2.12, based on the study by Smith et al that evaluated the prevalence of depression among foreign students (Asian and Caucasians) to native students in the U.S.A.[78]

Selecting equal sizes for a cross-sectional study for both Armenian and Indian medical students, $\alpha = 0.05$, and $1\text{-}\beta = 80\%$, the following equation[85] indicated each group needed to be consist of 203 students for a total of 406:

$$n = \frac{\left(C_{\frac{\alpha}{2}} \sqrt{\bar{P}\bar{Q}} - C_{1-\beta} \sqrt{P_1 Q_1 + P_2 Q_2} \right)^2}{(p_2 - p_1)^2}$$

A stratified convenience sampling by course was conducted among both the student populations. Indian students from first till third course were approached at the student hostel as compared to their Armenian peers who were contacted at the YSMU. All students from fourth till sixth course were approached at the respective hospitals were their classes were scheduled.

2.3 Data Collection

Data were gathered by distributing the questionnaire separately to each of the student from all six courses of both foreign and local medical student faculty by the student researcher either during an appropriate lecture period (in case of the students contacted at the University and hospitals) or in the reading hall or dormitories (for those who were contacted at the hostel) and collected at the end of each session. Permission to collect data from students was given by the Vice – Rector of the University. Aims and objectives of the study was explained along with the informed consent by the student researcher to the students in addition to the printed copies of the consent which were attached (Appendix 3,4) to the students' questionnaires. The consent form clearly specified that participation is entirely voluntary and that they could terminate their participation without any consequences.

2.4 Study instrument

The instrument used for this study was a paper based, anonymous, self-administered questionnaire. The questionnaire included the full CES-D, a short self-report scale designed to measure depressive symptomatology in the general population.[86] The CES-D has been translated to Armenian Language and validated.[87] Contents from the Perceived Medical School Stress (PMSS),[84] daily hassle[88] questionnaire and social readjustment scale[89]were used to assess general stress and that related to medical school education.

Participants rated 20 CES-D items (Appendices 1,2 (question 2a-2j)) on a scale ranging from zero (rarely or none of the time) to three (most or all of the time). Based on the positive predictive value, sensitivity, and specificity for depression, cutoff scores have been proposed for the CES-D. Globally, CES-D cutoff scores of less than 16 indicate no depression and 16 and above indicate probable depression.[20] Validation study conducted by

Demirchyan et al (2011)[87] shows that only 16 negatively formulated items (a shorter 16 item version CES-D (16))work in Armenia and in other eastern cultures. The most optimal cutoff score for CES-D (16) in the study is 19 with sensitivity of 0.86 and specificity of 0.81.[90]

The CES- D scores were calculated based on response values for each question. Possible range of scores is zero to forty-eight, with the higher scores indicating the presence of more symptomatology.

Five critical life events, derived from the Social readjustment rating scale (SRRS)[89]were asked to assess respondents' stress due to acculturation among Indian students. The students indicated yes/no for change in (1) sleeping habits, (2) eating habits, (3) dressing style, (4) living conditions, (5) place of residence from your native country, in the past year.

The content from daily hassle was scored according to the following: 1 = not at all part of my life, 2 = only slightly part of my life, 3= distinctly part of my life and 4= very much part of my life with higher scores indicating higher stress levels.

The content from medical school stress scale assessed medical school curriculum/environment, personal competence/ endurance and social/recreational life. The scoring followed these rules. The scoring scale was 0 = strongly disagree, 1 = disagree, 2 = mixed feelings, 3 = agree, 4 = strongly agree, with higher scores indicating higher stress level in each sphere.

To gain a deeper understanding of depressive symptoms in the foreign students, their experiences in Armenia (critical life events, racial/ ethnic discrimination and acculturation), cultural background (religion & state), financial background and motives for migration were assessed. Social/demographic variables were included. Racial/ ethnic discrimination were assessed with three item asking respondents if they had ever been discriminated against in

Armenia because of (1) their race/ ethnicity (2) skin color (3) language

2.5Data entry & analysis

The data collected were entered into and analyzed in the Statistical Package for the Social Sciences (SPSS) 17.0 statistical package. Data cleaning included checks for extreme values, inappropriate check marks, blanks and incorrect skip patterns. Continuous variables were described using means and standard deviations, and categorical variables were described using frequencies and percentages. Independent t-test was used to compare continuous variables and chi square test to compare categorical variables. Univariate percentages and means were calculated for demographic variables and other characteristics, followed by bivariate analysis and multivariable logistic regression analysis. Multiple logistic regression analysis was used to estimate the independent risk factors of developing depression after investigating for potential interactions and confounders. First, candidate variables for the model were selected based on the current literature and results from the univariate logistic regression analysis. Next, variables were added to the model one at a time and tested using the Likelihood Ratio test. Final model fit was tested by the Hosmer-Lemeshow goodness-of-fit test. Any variable with more than 10% missing values were excluded from the regression analysis. All results with the p value less than 0.05 were considered as statistically significant.

2.6Ethical Considerations

The Institutional Review Board (IRB) within the College of Health Sciences (CHS) at the American University of Armenia (AUA) approved the study protocol. Permission to conduct a survey among the students was obtained from Vice – Rector of the medical university. Participation in the study was on a voluntary basis. It was anonymous. The aims and objectives of the study were explained to students in addition to the consent form

(Appendices 3, 4) attached to the individual questionnaires. Participants were also informed that they may stop their participation at any time without consequence. It was explained to participants that this study would not benefit them, but that the results from this study might be used to formulate mental health protection and psychological well-being programs among health professionals. This study posed minimal threat to its participants; the only discomfort to the participants was the time spent in filling out the questionnaire. No personal identifiers were collected from the participants. All participants were assigned ID numbers. The paper data forms were destroyed after six months from the data collection to safeguard the privacy of the students.

3. Results

Out of the 487 students that were approached, 406 successfully completed the self-administered questionnaire. The response rate was 83.4 %. Indian and Armenian students from first till sixth year of study were selected to fill the questionnaire. Overall, 18 students were excluded from the study due to more than 30% missing data. The data from the final sample of 388 participants were used for the analysis.

3.1 Socio-demographic characteristics

Table 1 summarizes the basic descriptive characteristics of the study population. Out of the 388 interviewed participants, 199 (51.3%) were females and 189 (48.7%) were males. Majority (68.8%) of the students were 19 to 23 years old with the mean age being 20.9 (SD 2.37). Most (62.9%) of the students were single. Approximately the same number of students participated from each course. Among respondents, 197 (50.8%) were Armenians and 191 (49.2%) were Indian students. Indian students were mainly of the Hindu (40.1%) religion compared to Armenian students who were mostly Christian (98%). Majority of the Armenian students (98.4%) spoke Armenian as their native language while Indian students reported it

to be Hindi (53.4). Monthly family income of the majority of study population (60%) was between 100 to 800 US dollars. Indian students were found to have a higher prevalence rate of probable major depression as compared to Armenian students (50.8% vs. 27.9%).

3.2 Depression, daily hassle and medical school stress scores

The total average CES-D in the sample was14.62 (SD =8.84) as shown in Table 1. Overall, 278(71.6%) respondents had CES-D score < 19(no depression) and 110(28.4%) had >=19 (probably depressed). Indian students were found to have a higher prevalence rate (of 34.6%) of probable depression while it was 22.3% for the Armenian students. The means of perceived medical school stress and daily hassles scale score were 18.51 (SD = 3.86) and 18.97 (SD = 3.67) respectively (Table 1).

3.3 Factors associated with depression

Results of cross-tabulation of other important descriptive variables by depression score are presented in Table 2. Results of the unadjusted associations between depression status and independent variables with odds ratios (OR) and 95% confidence intervals (95% CI) are presented in the same table.

Out of the 191 Indian students, 66 (60.0%) were found to likely be depressed while 44 (40.0%) out of the 197 participants for Armenians reached this threshold. Indian students had 1.84 times higher odds (95% CI = 1.17 - 2.88, p = 0.00) of having probable depression as compared to their Armenian counterparts. More females (n = 65, 59.1%) were found to be probably depressed than males (n = 45, 40.9%) with an odds of 1.55(95% CI = 0.99 - 2.43). The amount of class material given to study appears to contribute towards the depression status. Students who thought the work load was too much but can be done appears to have a lower odds (OR = 0.40, 95% CI = 0.23 - 0.70, p = 0.00) of suffering from probable depression as compared to those who reported it be just right. With an additional increase in perceived medical school stress scale and daily hassles scale by one score, odds of being

probably depressed increase by multiplicatives of 1.18(95% CI = 1.11 – 1.26, p = 0.00) and 1.28(95% CI = 1.19 – 1.38, P = 0.00) respectively. No statistically significant association between probable depression and independent factors such as age, course year in the medical school, relationship status, current residence, career choice before admission into medical school, any alcohol consumption and any club/disco/bar visitations was observed in the sample. These variables were excluded from further analysis.

All significant independent variables in the bivariate logistic regression analysis were included in the initial multivariable logistic regression analysis(Table 3). All continuous independent variables were tested for multi-co linearity using the VIF (variance inflation factor) statistic (Table 4). The analysis found no multi-co linearity between the covariates.

Multivariable logistic regression analysis was performed to detect associations between the dependent and independent variables while adjusting for confounders (Table 5). Covariates that were not statistically significant were removed from the final model. Interaction terms were created and tested for a gender with all other covariates, but no interaction terms were statistically significant. Thus all interaction terms were removed from the final model (not shown).

The final model included gender, class material given to study, perceived medical school stress and daily hassles. The model had acceptable calibration (Hosmer - Lemeshow goodness-of-fit test (x^2 = 5.889, p = 0.660). Detailed analyses are presented in Appendix 5.

Multivariable logistic regression analysis found three important statistically significant risk factors for probable depression. Females were predisposed to depressive symptomatology almost twice that of males (OR = 1.715; 95% CI = 1.02 – 2.90, p = 0.04). Each additional one unit increase in the perceived medical school stress and daily hassles

scale was associated with an increased multiplicative risk of 1.16(95% CI = 1.08 – 1.25, p = 0.00) and 1.25 (95% CI = 1.16 – 1.35, p =0.00) respectively for developing probable depression. One protective factor related to course load was identified. Students who reported that the class material given to them was too much but can be done seemed to be at a lower risk of suffering from probable depression (OR = 0.38; 95% CI = 0.21 – 0.71, p = 0.00).

Table 6 reports the descriptive statistics on items from SRRS. Table 7 presents the results of bivariate analysis of these items with depression status. Although several students report (Table 6) feeling discriminated based on race (36.1%), language (54.1%) and skin (49.3%), these were not statistically significantly associated with probable depression (Table 7). The majority of the students reported change in sleeping (87.5%), eating (79.2%), dressing (69.4%) patterns and living conditions (84.7%); but these too were not found to be significant. Proficiency in Armenian, or lack of it, too was not found to be significantly associated with probable depression. The risk factors for developing depression were common to Indian and Armenian students.

4. Discussion

This cross-sectional study investigated the prevalence rate and the association of socio-demographic factors, migration-related, cultural and stressful life events with probable depression among the 197 Armenian and the 191 Indian medical students at YSMU aged 16-29 years old.

The study found that the prevalence of probable depression was 22.3% among Armenian students as compared to the higher 34.6% in their Indian counterparts. This finding is in agreement with the several studies that report that medical students experience depression[18,45,52] at a higher rate than general population.[48–50] Consistent with previously published studies[19–24]this study found that women were more (54.4 %) were likely to

experience depression**.** Likewise, consistent with the literature[20] no association was found between course year during the six-year course and depressive symptoms although most of these studies were cross sectional. Some studies do show that certain courses are more stressful than the other[47,53,65,66]. Also in agreement with the literature are the association of perceived medical school stress[64,84] and daily hassles[88] with depression.

Age, especially adolescent period have been identified as a time when young adults start developing depressive symptoms[22,24,25,29,77,79,83,90–93] although this study found no statistically significant association between the two. Financial security or lack of it[17,18] and family support[79] have been found to be significantly associated with depression; although this study did not find any association between family income, number of earning members or current residence. People suffering from depression have been known to adopt unhealthy coping mechanisms like turning to alcohol,[26,63] but the current study did not find any statistically significant association between alcohol consumption and probable depression. Although discrimination based on race, language, language proficiency and skin color were not found to be significantly associated with depression as were changes in sleeping, eating, dressing habits or living conditions in this study, literature review on acculturation[27,29–34,75,83,91,95–100] among larger study populations shows otherwise. The current study did not find any difference in risk factors for developing probable depression among Indians and Armenians contrary to the expectation. This null finding could be attributed to sample size limitations.

One factor was found to be protective. Students who were confident in managing their work load have lower risk of developing probable depression.

4.1 Study strengths

This study is one the few of its kind in the world and the first in Armenia to look into

the prevalence of probable depression and associated risk factors among immigrant and local medical students. Students from all six years were included in the study. To measure depression the short CES- D (16) questionnaire was used, which was validated and widely used in Armenian population as was the cutoff of 19 which was found to be optimal in a study conducted among the same population. The perceived medical school stress scale (from which items were taken) is specific for the study population and has been validated in English speaking countries. The social readjustment rating scale too it has been validated in several countries like Japanese, Latin American, European and Malaysian populations. Also many of the potential risk factors were measured by questions used widely internationally. The use of self - administered questionnaires and the absence of personal identifiers may have increased the validity of the findings, because it provided further confidentiality and hopefully provided impetus for students to answer to the questions more honestly, especially for more sensitive questions. The study also identifies a potential protective factor which can be used in developing coping strategies for medical students.

4.2 Study limitations

The study is cross-sectional which does not allow measurement of depressive symptoms at multiple times over an extended time frame. These findings also may not be generalizable to all foreign and local medical student populations in different settings. The PMMS scale and items from SRRS and DHS were not validated in the Armenian or Indian medical student population, however they have been validated in various settings internationally and the questions have been pretested in Armenia among the study population. The study was conducted close to the final examination period, which may have inflated stress measures and thereby impact the generalizability of these findings.

4.3 Conclusion

This study estimated the prevalence of probable major depression among the Indian

medical students at YSMU as almost twice as that of their Armenian peers. The study identified several important factors associated with the development of depression in Armenia. Being an Indian student in Armenia, female by gender, with a romantic partner, overwhelmed or bored with the course load all seem to increase the probability of being depressed. The study found a protective factor; the medical students' whose primary career choice was to become a doctor were less likely to be depressed after admission into the medical school.

4.3 Recommendations

The study findings can be used to better understand the various risk factors involved in the development of depression in medical students. It can assist in designing specifically targeted programs for medical students to reduce the likelihood of depression that may include mentoring, wellness and mental health programs. The programs may include offering counseling along with other forms of support for foreign medical students where a safe environment is provided for students via student body meetings or clubs to express their queries and concerns. Support centers can be established with the help of local Armenian students within the University to help the foreign students adjust better to the new place. Training sessions on mental health and distress (including suicide awareness) and workshops can be conducted for both students and staff.

Academic and non-academic sources of stress should be considered in curriculum planning and clinical training in hospitals. The educational system should deal with the potential stressors for students by stress management programs. Effective assistance from teaching staff and faculty administrators is essential. Mental health advisors can be appointed who can recommend strategies and interventions to reduce barriers to learning and to enable

successful progression through higher education. They can also offer support to newly enrolled students with experience of mental ill health during their transition to university.

Screening at the time of entrance and further evaluation of positive cases by a psychiatrist can establish baseline data. Follow-up studies for monitoring prevalence of depression will help in instituting intervention strategies. Further research is needed to replicate and expand the findings of this study to produce information that is generalizable and valid for the entire study population

References

1. WHO | Depression. Available at: http://www.who.int/mediacentre/factsheets/fs369/ Accessed May 11, 2014.

2. Diagnostic and Statistical Manual of Mental Disorders. DSM-IV-TR. Fourth Edition, Text Revision. Arlington, VA: American Psychiatric Association; 2000

3. WHO. No Title. *Int Classif Dis 10th Revis*. 2010. Available at: http://apps.who.int/classifications/apps/icd/icd10online/. Accessed January 17, 2013.

4. Mental W, Day H. A Global Crisis. 2012.

5. Murray CJ, Lopez a D. Global mortality, disability, and the contribution of risk factors: Global Burden of Disease Study. *Lancet*. 1997;349(9063):1436-42. doi:10.1016/S0140-6736(96)07495-8.

6. Osby U, Brandt L, Correia N, Ekbom a, Sparén P. Excess mortality in bipolar and unipolar disorder in Sweden. *Arch Gen Psychiatry*. 2001;58(9):844-50. Available at: http://www.ncbi.nlm.nih.gov/pubmed/11545667.

7. Almeida OP, Alfonso H, Hankey GJ, Flicker L. Depression, antidepressant use and mortality in later life: the Health In Men Study. *PLoS One*. 2010;5(6):e11266. doi:10.1371/journal.pone.0011266.

8. WHO. No Title. *World suicide Prev day*. 2012.

9. Questionnaire GH, Percep- MS, Scale AE, So- P. Depression and Other Psychological Risks Following Myocardial Infarction. 2003;60

10. Kessler RC, Akiskal HS, Ames M, et al. Prevalence and effects of mood disorders on work performance in a nationally representative sample of U.S. workers. *Am J Psychiatry*. 2006;163(9):1561-8. doi:10.1176/appi.ajp.163.9.1561.

11. Broadhead WE, Blazer DG, George LK, Tse CK. Depression, disability days, and days lost from work in a prospective epidemiologic survey. *JAMA*. 1990;264(19):2524-8. Available at: http://www.ncbi.nlm.nih.gov/pubmed/2146410.

12. Armenian HK, Morikawa M, Melkonian AK, Hovanesian A, Akiskal K, Akiskal HS. Risk factors for depression in the survivors of the 1988 earthquake in Armenia. *J Urban Health*. 2002;79(3):373-82. doi:10.1093/jurban/79.3.373.

13. Srapyan Z, Armenian HK, Petrosyan V. Health-related quality of life and depression among older people in Yerevan, Armenia: a comparative survey of retirement home and household residents aged 65 years old and over. *Age Ageing*. 2006;35(2):190-3. doi:10.1093/ageing/afj039.

14. Demirchyan A, Thompson ME. ARMAVIR HOUSEHOLD HEALTH ASSESSMENT : FOLLOW-UP 2004. 2004;(August).

15. Demirchyan A, Manager SP, Thompson ME. SEVAN HOUSEHOLD HEALTH ASSESSMENT : FOLLOW-UP 2004. 2004;(June).

16. Demirchyan A, Thompson ME. International Journal for Equity in Determinants of self-rated health in women : a population-based study in Armavir Marz , Armenia , 2001 & 2004. 2008;9:1-9. doi:10.1186/1475-9276-7-25.

17. Kennedy N, Abbott R, Paykel ES, T RA. Longitudinal syndromal and sub-syndromal symptoms after severe depression : 10-year follow-up study Longitudinal syndromal and sub-syndromal symptoms after severe depression : 10 -year follow-up study. 2014:330-336. doi:10.1192/bjp.184.4.330.

18. Dyrbye LN, Thomas MR, Shanafelt TD. Medical student distress: causes, consequences, and proposed solutions. *Mayo Clin Proc*. 2005;80(12):1613-22. doi:10.4065/80.12.1613.

19. Grigoriadis S, Robinson GE. Gender issues in depression. *Ann Clin Psychiatry*. 2007;19(4):247-55. doi:10.1080/10401230701653294.

20. Dyrbye LN, Thomas MR, Shanafelt TD. Systematic review of depression, anxiety, and other indicators of psychological distress among U.S. and Canadian medical students. *Acad Med*. 2006;81(4):354-73. Available at: http://www.ncbi.nlm.nih.gov/pubmed/16565188.

21. Nolen-Hoeksema S, Larson J, Grayson C. Explaining the gender difference in depressive symptoms. Journal of Personality and Social Psychology. 1999; 77(5):1061-1072.

22. Piccinelli M. Gender differences in depression: Critical review. *Br J Psychiatry*. 2000;177(6):486-492. doi:10.1192/bjp.177.6.486.

23. Disorder PD. Women and Depression page 2. 1(800):24-26.

24. Kessler RC, Berglund P, Demler O, et al. The epidemiology of major depressive disorder: results from the National Comorbidity Survey Replication (NCS-R). 2003;289(23):3095-3105.

25. Dick DM. Gene-Environment Interaction in Psychological Traits and Disorders. 2011. doi:10.1146/annurev-clinpsy-032210-104518.

26. Lindert J, Priebe S, Mielck A, Bra E. Author ' s personal copy Social Science & Medicine Depression and anxiety in labor migrants and refugees – A systematic review and meta-analysis Author ' s personal copy. 2009;69:246-257. doi:10.1016/j.socscimed.2009.04.032.

27. Hovey JD, Magaña C. Acculturative stress, anxiety, and depression among Mexican immigrant farmworkers in the midwest United States. *J Immigr Health*. 2000;2(3):119-31. doi:10.1023/A:1009556802759.

28. Hovey JD, Magan C. Acculturative Stress , Anxiety , and Depression among Mexican Immigrant Farmworkers in the Midwest United States. 2000;2(3).

29. Finch BK, Kolody B, Vega W a. Perceived discrimination and depression among Mexican-origin adults in California. *J Health Soc Behav*. 2000;41(3):295-313. Available at: http://www.ncbi.nlm.nih.gov/pubmed/11011506.

30. Mui AC, Kang S-Y. Acculturation stress and depression among Asian immigrant elders. *Soc Work*. 2006;51(3):243-55.

31. Baron-Epel O, Kaplan G. Can subjective and objective socioeconomic status explain minority health disparities in Israel? *Soc Sci Med*. 2009;69(10):1460-7. doi:10.1016/j.socscimed.2009.08.028.

32. Wiking E, Johansson S-E, Sundquist J. Ethnicity, acculturation, and self reported health. A population based study among immigrants from Poland, Turkey, and Iran in Sweden. *J Epidemiol Community Health*. 2004;58(7):574-82. doi:10.1136/jech.2003.011387.

33. Cook B, Alegría M, Lin JY, Guo J. Pathways and correlates connecting Latinos' mental health with exposure to the United States. *Am J Public Health*. 2009;99(12):2247-54. doi:10.2105/AJPH.2008.137091.

34. Gee GC, Ryan A, Laflamme DJ, Holt J. Self-reported discrimination and mental health status among African descendants, Mexican Americans, and other Latinos in the New Hampshire REACH 2010 Initiative: the added dimension of immigration. *Am J Public Health*. 2006;96(10):1821-8. doi:10.2105/AJPH.2005.080085.

35. Manuscript A. NIH Public Access. 2008;65(2):214-230.

36. Brown SC, Mason CA, Cruza-guet MC. NIH Public Access. 2010;21(3). doi:10.1177/0898264308328976.The.

37. Ostir G V, Eschbach K, Markides KS, Goodwin JS. Neighbourhood Composition and Depressive Symptoms among Older Mexican Americans composition and depressive Neighbourhood among older Mexican Americans. 2014;57(12):987-992.

38. Diala CC, Muntaner C, Walrath C, Nickerson K, LaVeist T, Leaf P. Racial/ethnic differences in attitudes toward seeking professional mental health services. *Am J Public Health*. 2001;91(5):805-7.

39. Tyssen R, Valgum P, Gronvolt N. Factors in medical school that predict postgraduate mental health problems in need of treatment: A nationwide and longitudinal study. *Med Educ*. 2001;35:110-20.

40. Mental health of students in higher education Royal College of Psychiatrists.

41. Dunn LB, Iglewicz A, Moutier C. Promoting Resilience and Preventing Burnout. 2008;(February).

42. Iversen A, Rushforth B, Forrest K. How to handle stress and look after your mental health. 2009;338(May):1139-1144. doi:10.1136/bmj.b1368.

43. Brown R, Dunn S, Byrnes K, Morris R, Heinrich P, Shaw J. Doctors' stress responses and poor communication performance in simulated bad-news consultations. *Acad Med*. 2009;84(11):1595-602. doi:10.1097/ACM.0b013e3181baf537.

44. Altaf M, Zahid S, Inayat A, Owais M, Jinnah F. MEDICAL STUDENTS BEARING MENTAL STRESS DUE TO THEIR ACADEMIC SCHEDULE. 2013;1(2):93-97.

45. Dyrbye LN, Thomas MR, Shanafelt TD. Systematic review of depression, anxiety, and other indicators of psychological distress among U.S. and Canadian medical students. *Acad Med*. 2006;81(4):354-73. Available at: http://www.ncbi.nlm.nih.gov/pubmed/16565188.

46. Students M. Letters to the editor. *J Am Vet Med Assoc*. 2014;244(10):1126-7. doi:10.2460/javma.244.10.1126.

47. Sidana S, Kishore J, Ghosh V, Gulati D, Jiloha R, Anand T. Prevalence of depression in students of a medical college in New Delhi: A cross-sectional study. *Australas Med J*. 2012;5(5):247-50. doi:10.4066/AMJ.2012.750.

48. Stress, Coping and Well- being among Third-year Medical Students.

49. Katz ED, Sharp L, Ferguson E. Depression among emergency medicine residents over an academic year. *Acad Emerg Med*. 2006;13(3):284-7. doi:10.1197/j.aem.2005.10.009.

50. Barry H l, Yuhko P. *Symptoms of Depression in residents: A South Carolina Family Practice Research Consortium Study*.; 1998:1305-1310.

51. Guille C, Speller H, Laff R, Epperson CN, Sen S. Utilization and barriers to mental health services among depressed medical interns: a prospective multisite study. *J Grad Med Educ*. 2010;2(2):210-4. doi:10.4300/JGME-D-09-00086.1.

52. Dyrbye LN, Thomas MR, Power D V, et al. Burnout and serious thoughts of dropping out of medical school: a multi-institutional study. *Acad Med*. 2010;85(1):94-102. doi:10.1097/ACM.0b013e3181c46aad.

53. Goebert D, Thompson D, Takeshita J, et al. Depressive symptoms in medical students and residents: a multischool study. *Acad Med*. 2009;84(2):236-41. doi:10.1097/ACM.0b013e31819391bb.

54. Alexandrino-silva C, Lazarini M, Pereira G, et al. Suicidal ideation among students enrolled in healthcare training programs : a cross-sectional study Ideação suicida entre estudantes da área da saúde : um estudo transversal. 2009;31(4):338-344.

55. Fan APC, Kosik RO, Mandell G a, et al. Suicidal ideation in medical students: who is at risk? *Ann Acad Med Singapore*. 2012;41(9):377-82. Available at: http://www.ncbi.nlm.nih.gov/pubmed/23052431.

56. Dyrbye LN, Thomas MR, Massie FS, et al. Burnout and suicidal ideation among US medical students. Ann Intern Med. 2008; 149(5): 334-341.

57. Ishak WW, Lederer S, Mandili C, et al. Burnout during residency training: a literature review. *J Grad Med Educ*. 2009;1(2):236-42. doi:10.4300/JGME-D-09-00054.1.

58. Dyrbye LN, Thomas MR, Eacker A, et al. Race, ethnicity, and medical student well-being in the United States. *Arch Intern Med*. 2007;167(19):2103-9. doi:10.1001/archinte.167.19.2103.

59. Ideation S, Medical US. Academia and Clinic. 2013.

60. Goebert D, Thompson D, Takeshita J, et al. Depressive symptoms in medical students and residents: a multischool study. *Acad Med*. 2009;84(2):236-41. doi:10.1097/ACM.0b013e31819391bb.

61. Schernhammer ES, Colditz G a. Suicide rates among physicians: a quantitative and gender assessment (meta-analysis). *Am J Psychiatry*. 2004;161(12):2295-302. doi:10.1176/appi.ajp.161.12.2295.

62. Tyssen R. Health problems and the use of health services among physicians: a review article with particular emphasis on Norwegian studies. *Ind Health*. 2007;45(5):599-610. Available at: http://www.ncbi.nlm.nih.gov/pubmed/18057803.

63. Rosenthal JM, Okie S. White coat, mood indigo--depression in medical school. *N Engl J Med*. 2005;353(11):1085-8. doi:10.1056/NEJMp058183.

64. Tjia J, Givens JL, Shea J a. Factors associated with undertreatment of medical student depression. *J Am Coll Health*. 2010;53(5):219-24. doi:10.3200/JACH.53.5.219-224.

65. Schwenk TL, Davis L, Wimsatt LA. in Medical Students. 2010;304(11):1181-1190.

66. Schwenk TL, Davis L, Wimsatt L a. Depression, stigma, and suicidal ideation in medical students. *JAMA*. 2010;304(11):1181-90. doi:10.1001/jama.2010.1300.

67. Center C, Davis M, Detre T, et al. Confronting depression and suicide in physicians: a consensus statement. *JAMA*. 2003;289(23):3161-6. doi:10.1001/jama.289.23.3161.

68. Bryant SG. The Depressed Physician : A Different Kind of Impairment. 2000;(February):67-74.

69. National Statistical Service [Armenia], Ministry of Health [Armenia], and ICF International. 2012. Armenia Demographic and Health Survey 2010. Accessed from http://www.measuredhs.com/pubs/pdf/FR252/FR252.pdf on 20/03/2013.

70. World Bank. No Title. Available at: http://data.worldbank.org/country/armenia.

71. Armenian History Language and Culture. Available at: http://www.worldtravelguide.net/armenia/history-language-culture. Accessed March 2, 2013.

72. Yerevan State Medical University. Available at: http://www.ysmu.am/ . Accessed March 14, 2013.

73. Personal communication with a member of department of foreign students.

74. Statistics V. Data Highlights -2001 Census.

75. Castro JR, Rice KG. Perfectionism and ethnicity: Implications for depressive symptoms and self-reported academic achievement. *Cultur Divers Ethnic Minor Psychol*. 2003;9(1):64-78. doi:10.1037/1099-9809.9.1.64.

76. Jambunathan J. Sociocultural factors in depression in Asian Indianwomen. *Heal Care Women Int*. 13(3):261-270.

77. Pantzer K, Rajmil L, Tebé C, et al. Health related quality of life in immigrants and native school aged adolescents in Spain. *J Epidemiol Community Health*. 2006;60(8):694-8. doi:10.1136/jech.2005.044073.

78. Song SJ, Ziegler R, Arsenault L, Fried LE, Hacker K. Asian student depression in American high schools: differences in risk factors. *J Sch Nurs*. 2011;27(6):455-62. doi:10.1177/1059840511418670.

79. Ge X, Conger RD, Elder GH. J. Pubertal transition, stressful life events, and the emergence of gender differences in adolescent depressive symptoms. *Dev Psychol*. 2001;37(3):404-417. doi:10.1037//0012-1649.37.3.404.

80. Susan HN, Joan G s. The emergence of Gender Differences in Depression During Adolescence. *Psycholo*.

81. Hovhannisyan M G. Dietary Changes Of First-Year Foreign Students Studying At Yerevan State Medical University. Master of Public Health Integrating Project Utilizing Professional Publication. 2007;(October).

82. Framework PP, Mahansaria K. Evaluation of Risk Factors Associated With Initiation and Changes in Habits Related to Smoking Among Migrant Indian Medical Students in Armenia. 2009;(June).

83. Berry JW. Lead Article - Immigration, Acculturation, and Adaptation. *Appl Psychol*. 1997;46(1):5-34. doi:10.1080/026999497378467.

84. Vitilano P, Russo J, J C, Judith H. Medical School Pressures and Their Relationship to Anxiety. 1984. doi:0022-3018/84/1721-2730.

85. Fleiss. *Statistical methods for rates and proportions*. 2 nd Editi. Wiley; 1981.

86. Center for Epidemiologic Studies Depression Scale (CES-D).

87. Demirchyan a, Petrosyan V, Thompson ME. Psychometric value of the Center for Epidemiologic Studies Depression (CES-D) scale for screening of depressive symptoms in Armenian population. *J Affect Disord*. 2011;133(3):489-98. doi:10.1016/j.jad.2011.04.042.

88. Forks G. The Daily Hassles Scale (Revised): Does it Measure Stress or Symptoms ? 1992;14(58202):465-482.

89. Holmes, T.H., & Rahe, R.H. (1967). The social adjustment rating scale. Journal of Psychosomatic Research, 11:213-218.

90. Framework PP, Movsisyan A. Diagnostic Accuracy of Post-traumatic Stress Disorder Checklist - Civilian Version and Modified Versions of Center for Epidemiologic Studies Depression Scale among 1988 Spitak Earthquake Survivors. 2013.

91. Stefanek E, Strohmeier D, Fandrem H, Spiel C. Anxiety , Stress & Coping : An Depressive symptoms in native and immigrant adolescents : the role of critical life events and daily hassles. 2011;(March 2013):37-41.

92. Harutyunyan T. Risk factors and prevalence of adolescent depression in Yerevan , Armenia (A Cross-Sectional Study) Master of Public Health Integrating Experience Project Professional Publication Framework by Armine Vardanyan , MPharm , MPH Candidate Advising Team : By. 2013.

93. Nuckols CC. The Diagnostic and Statistical Manual of Mental Disorders , Fifth Edition (DSM-5).

94. Dyrbye LN, Thomas MR, Shanafelt TD. Medical student distress: causes, consequences, and proposed solutions. *Mayo Clin Proc*. 2005;80(12):1613-22. doi:10.4065/80.12.1613.

95. Leow DM, Goldstein M, Mcglinchy L. Immigration , Acculturation & Substance Abuse. 2006.

96. Sieberer M, Maksimovic S, Ersöz B, Machleidt W, Ziegenbein M, Calliess IT. Depressive symptoms in first-and second-generation migrants: a cross-sectional study of a multi-ethnic working population. *Int J Soc Psychiatry*. 2012;58(6):605-13. doi:10.1177/0020764011418418.

97. Ornelas IJ, Perreira KM. The role of migration in the development of depressive symptoms among Latino immigrant parents in the USA. *Soc Sci Med*. 2011;73(8):1169-77. doi:10.1016/j.socscimed.2011.07.002.

98. De Wit M a S, Tuinebreijer WC, Dekker J, et al. Depressive and anxiety disorders in different ethnic groups: a population based study among native Dutch, and Turkish, Moroccan and Surinamese migrants in Amsterdam. *Soc Psychiatry Psychiatr Epidemiol*. 2008;43(11):905-12. doi:10.1007/s00127-008-0382-5.

99. Conrad MM, Pacquiao DF. Manifestation, attribution, and coping with depression among Asian Indians from the perspectives of health care practitioners. *J Transcult Nurs*. 2005;16(1):32-40. doi:10.1177/1043659604271239.

100. Manuscript A. NIH Public Access. 2013;68(4):428-433. doi:10.1001/archgenpsychiatry.2011.21.Migration.

Tables

Table 1: Participants' characteristics

Variable	All n= 388 n(%)	Armenian n = 197 n(%)	Indian n = 191 n(%)	Mean	SD	p-value
Socio - demographic characteristics						
Age *				20.90	2.37	0.66
16-18	63(16.2)	26(13.2)	37(19.4)			
19-23	267(68.8)	141(71.6)	126(66.0)			
24-29	58(14.9)	30(15.2)	28(14.7)			
Course year in medical school						0.20
First year	85(21.9)	35(17.8)	50(26.2)			
Second year	61(15.7)	18(9.1)	43(22.5)			
Third year	67(17.3)	33(16.8)	34(17.8)			
Fourth year	57(14.7)	34(17.3)	23(12.0)			
Fifth year	57(14.7)	30(15.2)	27(14.1)			
Sixth year	61(15.7)	47(23.9)	14(7.3)			
Gender						0.05
Female	199(51.3)	122(61.9)	77(40.3)			
Male	189(48.7)	75(38.1)	114(59.7)			
Relationship status						0.30
Single	244(62.9)	129(65.5)	115(60.2)			
Engaged	85(21.9)	46(23.4)	39(20.4)			
Married	10(2.6)	1(0.5)	9(4.7)			
Divorced	13(3.4)	5(2.5)	8(4.2)			
Other	36(9.3)	16(8.1)	20(10.5)			
Religion						
Hinduism	77(19.8)	0	77(40.3)			0.05
Christianity	250(64.4)	193(98.0)	57(29.8)			
Islam	38(9.8)	0	38(19.9)			
Sikhism	7(1.8)	0	7(3.7)			
Buddhism	3(0.8)	0	3(1.6)			
Other	11(2.8)	3(1.5)	8(4.2)			
Mother tongue						0.01
Armenian	188(48.5)	188(95.4)	0			
English	61(15.7)	9(4.6)	52(27.2)			
Hindi	102(26.3)	0	102(53.4)			
Tamil	13(3.4)	0	13(6.8)			
Malayalam	4(1.0)	0	4(2.1)			
Telugu	2(0.5)	0	2(1.0)			
Kannada	18(4.6)	0	18(9.4)			
Number of earning family members						0.05

Variable	All n= 388 n(%)	Armenian n = 197 n(%)	Indian n = 191 n(%)	Mean	SD	p-value
0-1	134(34.5)	53(26.9)	81(42.4)			
2	142(36.6)	73(37.1)	69(36.1)			
3	40(10.3)	22(11.2)	18(9.4)			
More than 3 (Ref)						
Family income per month						0.23
Less than $100	47(12.1)	24(12.2)	23(12.0)			
$100-$500	115(29.6)	55(27.9)	60(31.4)			
$500-$800	118(30.4)	67(34.0)	51(26.7)			
More than$800	108(27.8)	51(25.9)				
Other characteristics						
Current residence						0.74
Living with family	132(34.0)	123(62.4)	9(4.7)			
Away from family	256(66.0)	74(37.6)	182(95.3)			
Career choice before admission into medical school						0.94
Medical doctor	221(57.0)	112(56.9)	109(57.1)			
Other	167(43.0)	85(43.1)	82(42.9)			
Class material given to you is						0.00
Too much to do	33(8.5)	20(10.2)	13(6.8)			
Too much but can be done	158(40.7)	122(61.9)	36(18.8)			
Just right (Ref)	121(31.2)	41(20.8)	80(41.9)			
Too little	76(19.6)	14(7.1)	62(32.5)			
Alcohol consumption in the past week						0.29
Any consumption	99(25.5)	134(68.0)	36(18.8)			
No consumption	289(74.5)	63(32.0)	155(81.2)			
Club/bar/disco visitation in the past week						0.67
Any visitation	106(27.3)	65(33)	41(21.5)			
No visitation	280(72.2)	131(66.5)	149(78.0)			
Scales pertaining to depression						
Modified CES- D Score *				14.62	8.84	0.00
Probably Depressed	110(28.4)	44(22.3)	66(34.6)			
Not depressed	278(71.6)	153(77.7%)	125(65.4)			
Perceived medical school stress score *				18.51	3.86	0.00
Daily hassle scale				18.97	3.67	0.00

* Results are presented as frequencies and percentages unless specified otherwise.

Table 2: Binary logistic regression of key independent variables against probably depressed versus probably not depressed groups

Variable	Depressed (n = 110) n(%)	Not depressed (n = 278) n(%)	OR	95% CI	p-value
Nationality					
Armenian (Ref)	44(40.0)	153(55.0)	1		
Indian	66(60.0)	125(45.0)	1.84	1.17 - 2.88	0.00
Age					
16-18	16(14.5)	47(16.9)	0.70	0.32 - 1.54	0.37
19-23	75(68.2)	192(69.1)	0.80	0.44 - 1.48	0.48
24-29 (Ref)	19(17.3)	39(14.0)	1		
Course year in medical school					
First year (Ref)	24(21.8)	61(21.9)	1		
Second year	16(14.5)	45(16.2)	0.90	0.43 - 1.90	0.79
Third year	23(20.9)	44(15.8)	1.33	0.67 - 2.65	0.42
Fourth year	12(10.9)	45(16.2)	0.68	0.31 - 1.50	0.34
Fifth year	22(20.0)	35(12.6)	1.60	0.78 - 3.26	0.20
Sixth year	13(11.8)	48(17.3)	0.69	0.32 - 1.49	0.34
Gender					
Female	65(59.1)	134(48.2)	1.55	0.99 - 2.43	0.05
Male (Ref)	45(40.9)	144(51.8)	1		
Relationship status					
Single /divorced (Ref)	70(63.6)	187(67.3)	1		
Engaged/ Married	30(27.3)	65(23.4)	1.23	0.74 - 2.06	0.42
Complicated	10(9.1)	26(9.4)	1.03	0.47 - 2.24	0.95
Current residence					
Living with family (Ref)	36(32.7)	96(34.5)	1		
Away from family	74(67.3)	182(65.5)	1.08	0.66 - 1.73	0.74
Career choice before admission into medical school					
Medical Doctor (Ref)	63(57.3)	158(56.8)	1		
Other	47(42.7)	120(43.2)	0.98	0.63 - 1.54	0.94
Class material given to you is					
Too much to do	14(12.7)	19(6.8)	1.46	0.67 - 3.19	0.35
Too much but can be done	26(23.6)	132(47.5)	0.40	0.23 - 0.70	0.00
Just right (Ref)	42(38.2)	79(28.4)	1		
Too little	28(25.5)	48(17.3)	1.15	0.64 - 2.09	0.64
Alcohol consumption in the past week					

Variable	Depressed (n = 110) n(%)	Not depressed (n = 278) n(%)	OR	95% CI	p-value
Any consumption	24(21.8)	75(27.0)	0.75	0.45 - 1.28	0.29
No consumption (Ref)	86(78.2)	203(73.0)	1		
Club/bar/disco visitation in the past week					
Any visitation	30(27.3)	76(27.3)	0.91	0.61 - 1.64	0.99
No visitation (Ref)	80(72.7)	200(71.9)	1		
Number of earning family members					
0-1	45(40.9)	89(32.0)	1.18	0.55 - 2.54	0.67
2	42(38.2)	100(36.0)	0.98	0.46 - 2.11	0.96
3	11(10.0)	61(21.9)	0.42	0.17 - 1.07	0.07
More than 3 (Ref)	12(10.9)	28(10.1)	1		
Family income per month					
Less than $100	12(10.9)	35(12.6)	0.98	0.45 - 2.15	0.96
$100-$500	41(37.3)	74(26.6)	1.58	0.89 - 2.81	0.12
$500-$800	29(26.4)	89(32.0)	0.93	0.51 - 1.70	0.82
More than$800 (Ref)	28(25.5)	80(28.8)	1		
Perceived medical school stress score **			1.18	1.11 - 1.26	0.00
Daily hassles score **			1.28	1.19 - 1.38	0.00

* Based on modified CES-D score and cut off for these populations.
** Results are presented as frequencies and percentages unless specified otherwise.

Table 3: Preliminary multivariable logistic regression model for probable depression among YSMU medical students

Variable	OR	95% CI	p-value
Nationality			
Armenian (Ref)	1		
Indian	0.86	0.47 - 1.57	0.63
Gender			
Female	1.70	0.99 - 2.93	0.05
Male (Ref)	1		
Class material given to you is			
Too much to do	0.81	0.32 - 2.08	0.67
Too much but can be done	0.37	0.19 - 0.72	0.00
Just right (Ref)	1		
Too little	1.03	0.52 - 2.05	0.93
Number of earning family members			
0-1	1.09	0.46 - 2.59	0.85
2	0.94	0.34 - 2.24	0.89
3	0.46	0.16 - 1.31	0.15
More than 3 (Ref)	1		
Family income per month			
Less than $100	0.91	0.36 - 2.29	0.84
$100-$500	1.39	0.71 - 2.77	0.34
$500-$800	0.90	0.45 - 1.77	0.75
More than$800 (Ref)	1		
Perceived medical school stress score	1.15	1.07 - 1.24	0.00
Daily hassles score	1.26	1.16 - 1.37	0.00

Table 4: Testing for colinearity between covariates

Variable	VIF
Age	1.029
Perceived medical school stress score	1.093
Daily hassles score	1.310

* Based on modified CES-D score and cut off for these populations

Table 5: Final multivariable logistic regression model for probable depression among YSMU medical students

Variable	OR	95% CI	p-value
Gender			
Female	1.715	1.02 – 2.90	0.04
Male (Ref)	1		
Class material given to you is			
Too much to do	0.789	0.32 – 1.99	0.62
Too much but can be done	0.380	0.21 – 0.71	0.00
Just right (Ref)	1		
Too little	1.091	0.56 – 2.13	0.80
Perceived medical school stress	1.16	1.08 – 1.25	0.00
Daily hassles score	1.25	1.16 – 1.35	0.00

Table 6: Descriptive statistics on items from Social readjustment rating scale

Variable	Indian (n= 191) n(%)	
	Yes	No
Experienced discrimination in Armenia because of		
Race	67(35.1)	124(64.9)
Language	100(52.4)	91(47.6)
Skin color	89(46.6)	102(53.4)
Noticeable change in the following after coming to Armenia		
Sleeping pattern	165(86.4)	26(13.6)
Eating habit	155(81.2)	36(18.8)
Living condition	158(82.7)	33(17.3)
Dressing style	128(67.0)	63(33.0)
Proficiency in Armenian language		
Excellent	1(0.5)	
Very good	15(7.9)	
Mediocre	100(52.4)	
Bad	33(17.3)	
Very bad	42(22.0)	

Table 7: Bivariate analysis of different variables from the SRSS with probable depression status

Variable		Depressed (n= 124) n(%)		Not depressed (n = 63) n(%)		p-value
Experienced discrimination in Armenia because of		**Yes**	**No**	**Yes**	**No**	
	Race	20(37.9)	43(68.3)	47(37.9)	77(62.1)	0.41
	Language	36(55.4)	29(44.6)	64(51.6)	60(48.4)	0.62
	Skin color	29(43.9)	37(56.1)	60(48.4)	64(51.6)	0.56
Noticeable change in the following after coming to Armenia		**Yes**	**No**	**Yes**	**No**	
	Sleeping pattern	54(81.8)	12(18.2)	110(88.7)	14(11.3)	0.19
	Eating habit	51(78.5)	14(21.5)	102(82.3)	22(17.7)	0.53
	Living condition	52(78.8)	14(21.2)	104(84.6)	19(15.4)	0.32
	Dressing style	42(63.6)	24(36.4)	84(68.3)	39(31.7)	0.52
Proficiency in Armenian language						
	Very good	7(10.8)		9(7.5)		
	Mediocre	36(55.4)		58(48.3)		
	Bad	9(13.8)		24(20.0)		
	Very bad	13(20.0)		29(24.2)		

Appendices

ID:

Appendix 1: Questionnaire for Indian students

QUESTIONNAIRE FOR INDIAN STUDENTS

*Dear Participants, you are being asked to participate in a study which is aimed to assess the stressors that may lead to depression among medical students. Results obtained from this study can be used to inform policies and practices related to medical education. It is your wish to participate in this study. You can leave this study any time you want to. Filling out this form will take about 15 minutes of your time. The questionnaire does not ask you for any personal identifiers. All the information that you provide will not be given to anyone outside this study. You are requested to circle only **ONE** response. Questions requiring more than one response will tell you to do so. Your co-operation is highly appreciated and the researcher thanks you for your help.*

1. The following questions are about your experience in medical school. Indicate to what degree you agree or disagree with each of them. *Please answer all the questions by filling in the boxes below* (**mark only one box for each**).

	Strongly disagree	Disagree	Mixed feelings	Agree	Strongly agree
a) I am concerned that I will not be able to endure the long hours and responsibilities associated with clinical training and practice	□	□	□	□	□
b) Medical training controls my life and leaves too little time for other activities	□	□	□	□	□
c) I am concerned that I will be unable to master the entire pool of medical knowledge	□	□	□	□	□
d) This medical school is fostering a physician role at the expense of one's personality and interests	□	□	□	□	□
e) Medical school is more competitive than I expected	□	□	□	□	□

	Strongly disagree	Disagree	Mixed feelings	Agree	Strongly agree
f) The majority of students feel that success in medical school is in spite of the administration rather than because of it.	□	□	□	□	□
g) Medical school is cold, impersonal and needlessly bureaucratic	□	□	□	□	□

2. Some statements are given below. Using the following scale, please describe how you felt during the **past seven days**: how often have you felt like each of these? *Please answer all the questions by filling in the boxes below* ***(mark only one box for each).***

	During the past week			
	Less than once a day	1-2days	3-4 days	5-7days
a) I was bothered by things that usually don't bother me.	□	□	□	□
b) I did not feel like eating; my appetite was poor.	□	□	□	□
c) I felt like I could not get rid of my low mood even with the help of my family and friends.	□	□	□	□
d) I felt I was just as good as other people.	□	□	□	□
e) I had trouble keeping my mind on what I was doing.	□	□	□	□
f) I felt depressed.	□	□	□	□
g) I felt that everything I did was an effort.	□	□	□	□
h) I felt hopeful about the future.	□	□	□	□
i) I thought my life had been a failure.	□	□	□	□
j) I felt fearful.	□	□	□	□
k) My sleep was restless.	□	□	□	□

	During the past week			
	Less than once a day	1-2 days	3-4 days	5-7 days
l) I was happy.	□	□	□	□
m) I talked less than usual.	□	□	□	□
n) I felt lonely.	□	□	□	□
o) People were unfriendly	□	□	□	□
p) I enjoyed life.	□	□	□	□
q) I had crying spells	□	□	□	□
r) I felt sad	□	□	□	□
s) I felt that people dislike me.	□	□	□	□
t) I could not get ‘going’.	□	□	□	□

3. For each of the following statements, indicate to what degree it has been a part of your life ***over last month***. *Please answer all the questions by filling in the boxes below* (**mark only one box for each item**).

	Not at all part of my life	Only slightly part of my life	Distinctly part of my life	Very much part of my life
a) No enough time to meet my obligations.	□	□	□	□
b) Financial trouble	□	□	□	□
c) Conflicts with family/romantic partner.	□	□	□	□
d) Dissatisfaction from studies	□	□	□	□
e) Disliking my daily activities	□	□	□	□
f) Being let down or disappointed by friends	□	□	□	□
g) Adjustments to living with unrelated person(s) (e.g., roommate)	□	□	□	□
h) Lower evaluation of my work than you hoped for	□	□	□	□
i) Social isolation	□	□	□	□
j) Decisions about intimate relationship(s)	□	□	□	□

4. What is your course year in medical school?

a. First year
b. Second year
c. Third year
d. Fourth year
e. Fifth year
f. Sixth year

5. What is your gender?
   a. Female
   b. Male

6. What is your relationship status?
   a. Single
   b. Engaged
   c. Married
   d. Divorced
   e. Other(please specify) _____

7. To what religion do you belong?
   a. Hinduism
   b. Christianity
   c. Islam
   d. Sikhism
   e. Jainism
   f. Buddhism
   g. Other (please specify)_____

8. What is your mother tongue?
   a. Armenian
   b. English
   c. Hindi
   d. Tamil
   e. Malayalam
   f. Telugu
   g. Kannada
   h. Other (please specify) _____

9. Do you currently live with your family?

a. Yes

PLEASE SKIP TO QUESTION 13 IF YOU ANSWERED

b. No

10. How often do you miss your family? All the time

   a. Often
   b. Seldom
   c. Never

PLEASE SKIP TO QUESTION 12 IF YOU ANSWERED NEVER

11. When do you miss your family the most?
   a. When I am under stress
   b. During the exams
   c. When I am sick
   d. Others (please specify) _____

12. Since your admission into medical school, how many times have you visited your family in the past year?

a. Once
b. Twice
c. More than twice
d. I haven't been home in the past year

13. Before your admission into medical school, what did you want to become?

a. Architect
b. Engineer
c. Lawyer
d. Doctor
e. Other (please specify) _____

14. Do you think that the amount of class study material given to you to learn is

a. Too much for you to do
b. Too much but you can do it
c. Just the right amount
d. Too little

15. During the last 7 days how many times did you drink 2 or more portions of alcoholic drinks in a single day? (One portion of alcohol drink includes 1 glass of wine or a can/bottle of beer or a shot of liquor or whisky or vodka, or mixed drink).

a. I haven't
b. Once
c. Twice
d. Thrice
e. More than three times

16. During the past month, how many times have you visited a bar, disco or a club?

a. 0
b. 1
c. 2
d. 3
e. More than 3 times

17. What is your date of birth (DD/MM/YY)? _____ /_____ /_____

18. How many earning members are there in your family? (Please include only immediate

family members such as mother, father, brothers and sisters)

_____

19. What is your monthly family expenditure as of last month?

a. Less than Rs. 1,500
b. Rs. 1,500 to Rs. 5,000
c. Rs. 5,001 to Rs. 10,000
d. Rs. 10,001 to Rs. 30,000
e. Rs. 30,001 to Rs. 50,000
f. More than Rs. 50,000

20. The following questions are about your experiences in Armenia. Please answer all questions by selecting either **YES** or **NO** for each box. In Armenia, did you ever feel discriminated against because of your

	YES		NO
a. Race	□		□
b. Language	□		□
c. Skin color	□		□
After coming to Armenia, to what extent do you think you changed your	Completely changed	To some extent	Did not change at all
d. Sleeping pattern			
e. Eating habit			
f. Living condition			
g. Dressing style			

21. How would you rate your proficiency in Armenian Language?

a. Excellent
b. Very good
c. Mediocre
d. Bad
e. Very bad

THANK YOU FOR YOUR PARTICIPATION

Appendix 2: Questionnaire for Armenian students

ID: _____

ՀԱՐՑԱՇԱՐ ՀԱՅ ՈՒՍԱՆՈՂՆԵՐԻ ՀԱՄԱՐ

*Հարգելի մասնակից Դուք հրավիրված եք մասնակցելու այս հետազոտությանը, որի նպատակն է ուսումնասիրել սթրես առաջացնող այն գործոնները, որոնք կարող են ազդել բժշկական համալսարանի ուսանողների հոգեվիճակի վրա և նպաստել դեպրեսիայի առաջացմանը: Այս ուսումնասիրության արդյունքները կարող են օգտագործվել մշակելու ռազմավարություններ ուսումնական պրոցեսի ընթացքում բժշկական համալսարանի ուսանողների շրջանում լարվածությունը նվազեցնելու նպատակով: Ձեր մասնակցությունն այս հետազոտությանը կամավոր է: Ցանկացած ժամանակ կարող եք դադարեցնել Ձեր մասնակցությունը այս ուսումնասիրությունը: Այս հարցաթերթը լրացնելը Ձեզանից կպահանջի ոչ ավելի, քան տասնհինգ րոպե: Հարցաշարը Ձեզանից անձնական տեղեկատվություն չի պահանջում: Ձեր կողմից տրամադրված տեղեկատվությունը ուսումնասիրությունից դուրս այլ մարդու չի տրամադրվի: Ձեզանից պահանջվում է նշել միայն **ՄԵԿ** պատասխան: Մեկից ավելի պատասխաններ պահանջող հարցերի մասին կնշվի հարցին կից ցուցումներում: Ձեր համագործակցությունը բարձր է գնահատվում, և հետազոտողը շնորհակալ է Ձեր օգնության համար:*

i. Հետևյալ հարցերը վերաբերում են բժշկական համալսարանում Ձեր փորձառությանը: Խնդրում եմ, ասացեք, թե որքանով եք դուք համաձայն նշվածներից յուրաքանչյուրին: *Պատասխանեք, խնդրեմ, բոլոր հարցերին՝ լրացնելով վանդակները* **(յուրաքանչյուրի համար նշեք <u>միայն մեկ վանդակ</u>):**

	Բոլորովին համաձայն չեմ	Համաձայն չեմ	Ոչ համաձայն եմ, ոչ էլ՝ ոչ	Համաձայն եմ	Միանգամայն համաձայն եմ
ա)Ինձ անհանգստացնում է այն, որ չեմ կարողանա դիմանալ բժշկական ուսուցման և պրակտիկայի հետ կապված երկար ժամերին և պատասխանատվությունը:	☐	☐	☐	☐	☐
բ) Բժշկական ուսուցումը կառավարում է կյանքս և շատ քիչ ժամանակ է մնում այլ գործողությունների համար:	☐	☐	☐	☐	☐
գ) Ինձ անհանգստացնում է այն, որ չեմ կարողանա յուրացնել բոլոր բժշկական գիտելիքները	☐	☐	☐	☐	☐
դ) Այս բժշկական համալսարանը նպաստում է բժշկի դերի յուրացմանը՝ յուրաքանչյուրի բնավորությանը և հետաքրքրություններին համապատասխան	☐	☐	☐	☐	☐
ե) Բժշկական համալսարանն ավելի մրցակցային է, քան ես ակնկալում էի:	☐	☐	☐	☐	☐

	Բոլորո վին համաձ այն չեմ	Համ աձայ ն չեմ	Ոչ համա-ձայն եմ, ոչ էլ՝ ոչ	Համ աձայ ն եմ	Միանգ ամայն համաձ այն եմ
զ)Ուսանողների մեծամասնությունը կարծում է, որ բժշկական համալսարանում հաջողության հասնելը ոչ թե ղեկավարության շնորհիվ է, այլ նրանցից անկախ	□	□	□	□	□
է)Բժշկական համալսարանը սառն է, անմարդկային և անտեղի բյուրոկրատական:	□	□	□	□	□

2.Նշեք, խնդրեմ, թե վերջին 7 օրվա ընթացքում Դուք որքան հաճախ եք զգացել Ձեզ այնպես, ինչպես նկարագրված է այստեղ: *Պատասխանեք, խնդրեմ,* ***բոլոր հարցերին*** *լրացնելով վանդակները* **(յուրաքանչյուրի համար նշելով <u>միայն մեկ</u> վանդակ):**

	Անցյալ շաբաթվա ընթացքում			
	1 օրից քիչ	1-2 օր	3-4 օր	5-7 օր
ա)Ես հուզվում էի այնպիսի բաներից, որոնք սովորաբար ինձ չէին հուզում:	□	□	□	□
բ)Ես չէի ուզում ուտել: Վատ ախորժակ ունեի:	□	□	□	□
գ) Ես չէի կարողանում ազատվել տխրությունից անգամ ընտանիքիս և ընկերներից օգնությամբ:	□	□	□	□
դ) Ես զգում էի, որ լավն եմ նույնքան, որքան մյուս մարդիկ:	□	□	□	□
ե)Ես չէի կարողանում ուշադրությունս կենտրոնացնել արածիս վրա:	□	□	□	□
զ) Ես ինձ ընկճված էի զգում:	□	□	□	□
է) Ես ամեն ինչ անում էի մեծ դժվարությամբ:	□	□	□	□
ը) Ես լի էի հույսով ապագայի նկատմամբ:	□	□	□	□

	Անցյալ շաբաթվա ընթացքում			
	1 օրից քիչ	1-2 օր	3-4 օր	5-7 օր
թ) Ես մտածում էի, որ կյանքս իզուր է անցել:	□	□	□	□
ժ) Ես վախ էի զգում:	□	□	□	□
խ) Ես վատ էի քնում:	□	□	□	□
ծ)Ես երջանիկ էի:	□	□	□	□
կ) Ես ավելի քիչ էի խոսում, քան սովորաբար:	□	□	□	□
հ) Ես ինձ միայնակ էի զգում:	□	□	□	□
ձ) Մարդիկ անբարյացակամ էին:	□	□	□	□
ղ) Ես վայելում էի կյանքը:	□	□	□	□
ճ) Ես լացի պոռթկումներ էի ունենում:	□	□	□	□
մ) Ես տխուր էի	□	□	□	□
յ) Ես զգում էի, որ դուր չեմ գալիս մարդկանց:	□	□	□	□
ն)Ես չէի կարողանում հունի մեջ ընկնել:	□	□	□	□

3.Հետևյալ պնդումներից յուրաքանչյուրի համար նշեք, թե դրանք Ձեր կյանքի որքան մասն են կազմել վերջին **մեկ ամսվա** ընթացքում: *Պատասխանեք, խնդրեմ, բոլոր հարցերին՝ լրացնելով վանդակները* **(յուրաքանչյուրի համար նշեք <u>միայն մեկ</u> վանդակ):**

	Ոչ մի հատված իմ կյանքից	Միայն իմ կյաոքի փոքր հատվածը	Իմ կյաքի զգալի հատվածը	Իմ կյանքի շատ մեծ հատվածը
ա) ժամանակ չունեմ իմ պարտականությունները կատարելու համար:	☐	☐	☐	☐
բ) ֆինանսական խնդիրները	☐	☐	☐	☐
գ)Կոնֆլիկտներ ընտանքի)զուգընկերոջ հետ	☐	☐	☐	☐
դ) Անբավարարվածություն դասերից	☐	☐	☐	☐
ե)Ինձ դուր չեն գալիս իմ ամենօրյա գործողությունները	☐	☐	☐	☐
զ) Նվաստացումներ կամ հիասփափություն ընկերների պատճառով	☐	☐	☐	☐
է) Անհամատեղելիություն մեկի հետ ապրելուց (օրինակ՝ միևնույն սենյակում բնակվող ընկերոջից/ հարևանից)	☐	☐	☐	☐
ը)Ավելի ցածր գնահատական քո աշխատանքի համար, քան դու ակնկալում էիր	☐	☐	☐	☐
թ) Սոցիալական մեկուսացում	☐	☐	☐	☐
ժ) Որոշումներ ինտիմ հարաբերությունների հետ կապված	☐	☐	☐	☐

4. Բժշկական համալսարանի ո՞ր կուրսում եք:
   ա) առաջին
   բ)երկրորդ
   գ) երրորդ
   դ)չ ո ր ր ո ր դ
   ե)հ ի ն գ ե ր ո ր դ
   զ) վ ե ց ե ր ո ր դ

5. Ձ ե ր ս ե ռ ը ?
   ա) ար ակ ան
   բ) ի գ ակ ան

6. Ի՞ ն չ կ ար գ ավ ի ճ ակ ու ն ե ք ?
   ա) մ ի այ ն ակ
   բ) ն շ ան ադ ր վ ած
   գ) ամ ո ւ ս ն ա ց ած
   դ)ամ ո ւ ս ն ալ ու ծ վ ած
   ե) այ լ (խն դ ր ո ւ մ ե ն ք ն շ ե լ)_____

7. Ի՞ ն չ կ ր ո ն ի ե ք պ ատ կ ան ո ւ մ ?

   ա) ք ր ի ս տ ո ն ե ո ւ թ յ ո ւ ն
   բ)այ լ (խն դ ր ո ւ մ ե ն ք ն շ ե լ)_____

8. Ո՞ ր ն է ձ ե ր մ այ ր ե ն ի լ ե զ ո ւ ն
   ա) հ այ ե ր ե ն
   բ) ան գ լ ե ր ե ն
   գ) այ լ (խն դ ր ո ւ մ ե ն ք ն շ ե լ)_____

9. Ո ր տ ե ղ ե ք Դ ո ւ ք ապ ր ո ւ մ
   ա) Ե ր ե ւ ան ո ւ մ
   բ) մ ար զ ո ւ մ
   գ) այ լ (խն դ ր ո ւ մ ե ն ք ն շ ե լ)_____
10. Դ ո ւ ք ն ե ր կ այ ո ւ մ ս ապ ր ո ւ մ ե ք Ձ ե ր ը ն տ ան ի ք ի հ ե տ
    ա) այ ո

    Եթե պատասխանը այո է, միանգամից անցեք 13-րդ հարցին, եթե պատասխանը ոչ է, ապա շարունակեք

    բ) ո չ

11. Ո ր ք ա՞ ն հ աճ ախ ե ք կ ար ո տ ո ւ մ ձ ե ր ը ն տ ան ի ք ը
    ա) ամ բ ո ղ ջ ժ ամ ան ակ
    բ) հ աճ ախ,
    գ) հ ազ վ ադ ե պ
    դ) ե ր բ ե ք

    Խնդրում ենք անցնել <u>հարց 12-ին</u>, եթե Ձեր պատասխանն է ետբեբ

12. Ե՞րբ եք ամենաշատը կարոտում Ձեր ընտանիքին
ա) երբ ես սթրես եմ տանում
բ) քննությունների ժամանակ
գ) երբ ես հիվանդ եմ
դ) այլ (խնդրում ենք նշել)_____

13. Բժշկական համալսարան ընդունվելուց սկսած քանի՞ անգամ եք այցելել Ձեր ընտանիքին անցյալ տարվա ընթացքում:
ա) մեկ անգամ
բ) երկու անգամ
գ) ավելի քան երկու անգամ
դ) ես անցյալ տարվա մեջ ես չեմ այցելել տուն
14. Մինչև բժշկական համալսարան ընդունվելը ի՞նչ էիք ցանկանում դառնալ:

ա)ճարտարապետ
բ)ինժեներ
գ) իրավաբան
դ) բժիշկ
ե) այլ (խնդրում ենք նշել)_____
15. Վերջին 7 օրվա ընթացքում քանի անգամ եք օգտագործել 2 կամ ավելի բաժին ալկոհոլային խմիչք միևնույն օրվա մեջ (մեկ բաժին ալկոհոլային խմիչքը ներառում է 1 գավաթ գինի կամ 1շիշ գարեջուր կամ 1 բաժակ լիկյոր կամ վիսկի կամ խառը խմիչք)
ա) շատ ձեզ համար
բ) շատ, բայց դուք ի վիճակի եք այն կատարել
գ) ճիշտ անակնկալությամբ է
դ) շատ քիչ է

16. Անցյալ շաբաթվա ընթացքում որքա՞ն ալկոհոլ եք օգտագործել (այդ թվում գարեջուր, օղի, գինի, վիսկի և ալկոհոլով կոկտեյլներ):
ա) չեմ օգտագործել
բ) մեկ անգամ
գ) երկու անգամ
դ) երեք անգամ
ե) ավելի քան երեք անգամ

17. Անցյալ ամսվա ընթացքում քանի՞ անգամ եք այցելել բար, դիսկոկամակումբ
    ա.0
    բ. 1
    գ. 2
    դ. 3
    ե. Ավելի քան երեք անգամ

18. Ծննդյան տարեթիվը (օր/ամիս/տարի):____/_____

19. Քանի՞ հոգի են ձեր ընտանիքում աշխատում (խնդրում ենք ներառել ձեր ընտանիքի անդամներին օրինակ հայր, մայր, եղբայրներ և քույրեր)_____

20. Որքա՞ն է կազմում ձեր ընտանիքի ամսական ծախս
    ա) 10 000 դրամից քիչ
    բ) 10,001 – 35,000 դրամ
    գ) 35,001- 70,000 դրամ
    դ) 70,001 – 125,000 դրամ
    ե) 125,001 - 365,000 դրամ
    զ) Ավելի քան 365,000 դրամ

ՇՆՈՐՀԱԿԱԼՈՒԹՅՈՒՆ ՄԱՍՆԱԿՑՈՒԹՅԱՆ ՀԱՄԱՐ

Appendix 3: Consent form for Indian students

CONSENT FORM FOR STUDENTS OF THE YEREVAN STATE MEDICAL UNIVERSITY

Dear Participant,

I am Merine Jos, a medical student and the graduate student of a Master of Public Health program at the American University of Armenia. You are being asked to participate in a study which is aimed to assess stressors that may lead to depression among medical students. Group numbers for Indian and Armenian students have been obtained from the Foreign and Local Students' Department respectively. Completing this survey will take about 15 minutes of your time.

Your participation in this study is voluntary. It is your right to decide whether or not to complete the questionnaire. You have the right to decline participation anytime during the study or refuse to answer to any question if you want so. Your participation – or not - will not affect you or your study in any way. The questionnaire does not ask you for any personal information including your name, address etc. Your name or other personal details will not be recorded.

No university authorities, including your dean and instructors, will know whether or not you participated. Results obtained from this study will only be reported in aggregated form. You will not receive any compensation for participating in this study; however your sincere answers will help to develop and used to inform policies and practices related to medical education. You are requested to select only ONE response per item. Your co-operation is highly appreciated and valuable. The researcher thanks you for your help.

If you have any questions about this study you can call to the Associate Dean of the School of Public Health Dr. Varduhi Petrosyan, (37410) 512592. If you believe that you have not been treated fairly or were offended while participating in this study, you may contact Dr. Hripsime Martirosyan, the Human Subject Protection Administrator of the American University of Armenia (37410) 51 25 61.

Appendix 4: Consent form for Armenian students

Համաձայնագրի ձևաթուղթ Երևանի Մխիթար Հերացու անվան Բժշկական

Համալսարանի ուսանողների համար

Հարգելի մասնակից,

Ես Մերին Ջոսան եմ, Երևանի պետական բժշկական համալսարանի և Հայաստանի ամերիկյան համալսարանի հանրային առողջապահության մագիստրոսի ծրագրի ավարտական կուրսի ուսանողեմ: Ձեզ հրավիրում եմ մասնակցելու այս ուսումնասիրությանը, որի նպատակն է գնահատելու, թե ինչ գործոններ կարող են ազդել բժշկական համալսարանի ուսանողների հոգեվիճակի վրա հանգեցնել դեպրեսիայի: Հայ և հնդիկ ուսանողների խմբերի համարները ձեռք են բերվել բժշկական համալսարանի համապատասխան բաժիններից:

Ձեր մասնակցությունն այս ուսումնասիրությանը կամավոր է: Դուք իրավունք ունեք ուսումնասիրության ընթացքում ցանկացած ժամանակ հրաժարվել մասնակցությունից կամ հրաժարվել պատասխանել ցանկացած հարցի; Ձեր մասնակցությունը կամ հրաժարումը մասնակցությունից Ձեր կամ Ձեր ուսման վրա ոչ մի ազդեցություն չի ունենա:

Հարցաշարը ձեզնից ոչ մի անձնական տեղեկություն (ներառյալ անուն, հասցե և այլ տվյալներ) չի պահանջի: Ձեր անունը և այլ անձնական տվյալները չեն գրանցվի:

Համալսարանի ղեկավարությունը, ինչպես նաև ղեկանը և դասախոսները չեն տեղեկանա Ձեր մասնակցության մասին: Հետազոտության արդյունքները

կներկայացվեն ընհանրացված կերպով: Դուք որևէ պարգևատրում չեք ստանա հետազոտությանը մասնակցելու դեպքում, սակայն Ձեր անկեղծ պատասխանները օգտակար կլինեն մշակելու ռազմավարություններ ուսումնական պրոցեսի ընթացքում բժշկական համալսարանի ուսանողների շրջանում լարվածությունը նվազեցնելու նպատակով: : Հարցերի դեպքում կարող եք զանգահարել Հայաստանի ամերիկյան համալսարանի փոխդեկան՝ Վարդուհի Պետրոսյանին, հետևյալ հեռախոսահամարով՝ (37410) 512592: Եթե գտնում եք, որ այս հետազոտության շրջանակներում Ձեզ հետ անարդար են վարվել կամ այս հետազոտությանy մասնակցելու դեպքում Ձեղ վնաս է հասցվել, կարող եք zangaha8el Հայաստանի ամերիկյան համալսարանի Գիտական էթիկայի հանձնաժողովի համակարգող՝ Հռիփսիմե Մարտիրոսյանի հետ (37410) 51 25 61 հեռախոսահամարով:

Appendix 5: Details of multivariable logistic regression analyses

Variable	OR	P>|z|	95%CI	Log LL test	
Model 1				458.918	
Gender					
Female	1.552	0.054	0.993 – 2.427		
Model 2				439.844	Compared to the Model 1 x^2 = 19.074 p < 0.001
Gender Female					
	1.671	0.033	1.042 – 2.681		
Class material given to you is					
Too much to do	1.262	0.568	0.568 – 2.803		
Too much but can be done	0.387	0.001	0.220 – 0.682		
Too little	1.244	0.480	0.679 – 2.276		
Model 3				412.537	Compared to Model 2 x^2 = 46.381 p < < 0.001
Gender					
Female	1.684	0.037	1.032 – 2.747		
Class material given to you is					
Too much to do	0.339	0.581	0.339 – 1.835		
Too much but can be done	0.190	0.000	0.190 – 0.615		
Too little	0.616	0.642	0.616 – 2.192		
Perceived medical school stress	1.107	0.000	1.107 – 1.266		
Model 4				375.636	Compared to Model 3 x^2 = 64.208 p <<< 0.001
Gender					
Female	1.715	0.043	1.017 – 2.894		
Class material given to you is					
Too much to do	0.789	0.615	0.314 – 1.985		

Variable	OR	P>|z|	95%CI	Log LL test
Too much but can be done	0.380	0.002	0.205 – 0.706	
Too little	1.091	0.798	0.558 – 2.133	
Perceived medical school stress	1.161	0.000	1.082 – 1.245	
Daily hassles scale	1.250	0.000	1.156 – 1.352	

Assessment of final model fit

1. Model calibration: Goodness- of- fit test
Hosmer-Lemeshow x^2 = 5.889
p = 0.660