STRESS AND LIFESTYLE CHOICES AMONG INTERNATIONAL LSMU STUDENTS

Medicine
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1. SUMMARY

Author: Yasmine Jafari
Title: Stress and lifestyle choices among international medical students at LSMU University
Scientific Supervisor: Jevgenij Razgulin, Department of Health Psychology. Head of Department Prof. Zemaitiene.

Aim of the study: The aim of the study is to investigate the nature of stress and its link to lifestyle choices among international students at Lithuanian University of Health Sciences (LSMU).

Objectives: To assess stress levels among international students. To assess the indicators of lifestyle among international students: smoking, diet, exercise, caffeine intake, sleep habits, drug use and over the counter medications. To evaluate the association between stress and lifestyle.

Subjects and Methodology: Study subjects were international university students at LSMU university. Research was carried out using the Perceived Stress Scale and FANTASTIC lifestyle questionnaire which were administered randomly at the university library ensuring confidentiality and anonymity of the participants.

Results: The results of the research showed there was a moderate and significant correlation between stress levels and lifestyle choices among international students. There is a difference in stress and lifestyle between genders but it is not statistically different. Younger students tend to suffer higher stress levels. Good sleep hygiene and exercise was correlated with lower levels of stress. A Substantial amount of students don’t smoke or consume alcohol, but those who do smoke are heavy smokers. Majority of students don’t use drugs or consume over the counter drugs. Also negative mood was associated with higher levels of stress.

Conclusion: Students who had lower levels of stress slept better and exercised more. Students who had higher levels of stress had worse mood and tend to smoke more. Prevalence of stress and lifestyle does not significantly differ among the different genders but higher levels of stress are found among younger students and females.

Recommendations: These findings should be considered in instigating preventive programs to promote health awareness among international students and activities to provide support to aid students cope with levels of stress throughout their academic years.

Key words: International students, stress, lifestyle choices.
2. SUMMARY (Lithuanian/ Lietuvių k.)

Autorius: Yasmine Jafari

Pavadinimas: LSMU tarptautinių medicinos studentų stresas ir gyvensenos pasirinkimai.

Mokslinis vadovas: Jevgenij Razgulin, Sveikatos psychologijos katedra. Katedros vedėja Prof. N. Žemaitienė.

Tyrimo tikslas: Šio tyrimo tikslas yra ištirti Lietuvos sveikatos mokslų universiteto (LSMU) tarptautinių studentų stresą ir jo sąsajas su gyvensenos pasirinkimais.

Uždaviniai: Įvertinti tarptautinių studentų streso lygį. Įvertinti tarptautinių studentų gyvensenos rodiklius, tokius kaip rūkymą, mitybą, manksčinimą, kofeino vartojimą, miego išpročius, narkotinių medžiagų vartojimą ir receptinių vaistų vartojimą. Įvertinti sąsajas tarp streso ir gyvensenos.

Tiriamieji ir metodologija: Tyrimo mokslinis tikslas yra atskleidžiant ir tyrinėti Lietuvos sveikatos mokslų universiteto bibliotekoje, ūtinkrinant tyrimo dalyvių konfidencialumą ir anonimiškumą.


Išvados: Studentai, kurie turėjo žemesnį streso lygį, geriau miegojo ir daugiau manksčinosi. Tie studentai, kurie turėjo aukštesnį streso lygį, pasižymėjo prastesne nuotaika ir daugiau rūkė. Streso lygis ir gyvensena reikšmingai nesiskyrė tarp skirtingų lyčių studentų, tačiau aukštesnės streso lygis buvo aptinkamas tarp moterų ir jauniesių studentų.

Rekomendacijos: Šio tyrimo rezultatus turėtų atkreipiamas dėmesys kuriant prevencijos programas, kurių tikslas būtų skatinti tarptautinių studentų sveikatinimą veiklus ir sąmoningumą bei kurios studentams padėtų per akademinius metus sėkmingiau įveikti stresą.

Raktiniai: Tarptautiniai studentai, stresas, gyvensenos pasirinkimai.
3. ACKNOWLEDGMENT

The author would like to thank Jevgenij Razgulin who guided me and gave feedback throughout the process of this research. Dr. Roman Nevzorov who helped formulate the statistics of this research and the participated medical students for filling the surveys. Also I would like to thank Jeanie Jafari for correcting and editing the research and contributing to it from beginning to end until it was complete.
4. CONFLICT OF INTEREST

The author reports no conflicts of interest.
DEL PRITARIMO TYRIMUI


Bioetikos centro vadovas doc. Eimantas Pečiūnas
5. ABBREVIATION LIST

1. PSS = Perceived stress scale
2. SPSS= Statistical Package for Social Science
3. IQR= Inter-Quartile Range
6. TERMS

FANTASTIC Lifestyle acronym = : F - family and friends, A - physical activity/affiliation, N - nutrition, T - tobacco, A - alcohol and other drugs, S - sleep/stress, T - work/type of personality, I - insight, and C= career satisfaction; (adapted to academic satisfaction for the purpose of this study.)
7. INTRODUCTION

The international medical program in LSMU was established in order to enable students to obtain a degree in an international environment. It is natural that stress is a major component in a students life throughout their studies as many factors come into play as the student is subjected to various academic and environmental changes. (1) University students are in a socio-demographic age span in which stress related disorders are common. Additionally the academic period involves the employment of time and financial resources without guarantees of a satisfactory return. (2)

The experience of International students traveling overseas seeking a medical degree abroad can be very exciting but with it the student is entering a new culture, and is faced with high pressure to succeed in a new environment, while having to cope with increased academic workload, the stress of living independently, the difficulty of adjusting to cultural and personality differences as well as language constraints, and being away from friends and family. (3) This pressure can lead to a worsening in lifestyle perception in its various aspects like health, physical and psychological, environmental and social. (4) The academic workload and the social isolation leads many students to seek refuge in food, alcohol, smoking as well as neglecting physical activity. These habits when developed in adolescents often persists into adulthood affecting life long health and are identified as health risk behaviors as computed by Von Bothmer on healthy life style behaviors. (5)(6)

Attention to promotion of well being among students is essential because the evidence suggest that their life style behaviors are problematic. It can be assumed the reasons for these acquired habits are attempts to cope with the stress brought about by the high demands of the course. In a research carried out among international students in Lithuania examining the causes of stress and coping methods it was demonstrated that the main sources of stress were academic stress, heavy workload and the pressures of the need to succeed. (7) However little research is available with regards to stress and lifestyle habits among international students. This study will attempt to find a connection between international students stress levels and lifestyle indicators.
8. AIM AND OBJECTIVES

The aim of the study is to investigate the nature of stress and its link to changes in lifestyle among international students at LSMU. This will act as a base to promote awareness of students stress and put in place support to help cope with stress.

Objectives:
1. To assess stress levels among international students
2. To assess the indicators of lifestyle among international students
3. To evaluate the association between levels of stress and lifestyle indicators among international students at LSMU University.
9. LITERATURE REVIEW

1. Stress and International Students

Stress and the way it affects the general population is of major interest and has been extensively investigated in researches done among various population around the world. Stress as defined by Hans Selye, who coined the term, is the "wear and tear" on our physical and psychological being as we are subjected to changing environmental conditions. It can also be described as a situation created in which the individual is unable to produce an effective response to environmental requirements or demands. In other words, when the pressure on a person overwhelms his coping ability, stress comes into play. Stress is the body’s reaction to harmful situations whether they are real or perceived. When one feels threatened a chemical reaction occurs in the body that allows it to act in a way to prevent injury. This reaction is known as “fight or flight” or the distress response. During stress response heart rate increases, breathing quickens, muscle tighten and blood pressure rises. Stress symptoms can effect a person’s body, mental health, feelings and behavior and if left unchecked can contribute to many long term health problems for the body and the mind such as obesity, diabetes and heart problems. Many disorders stem from stress particularly if it is severe and sustained so it is important to appreciate the role stress may play in a person's physical and psychological welfare in order to preempt various diseases.

International students are particularly vulnerable to stress because of potentially threatening demands of the course and challenges of the overwhelming amount of time and effort required to complete the degree. Trying to efficiently divide the time between long hours of study, stressful exam periods with tight schedules and overload of new study material are all factors that can cause stress. A student can feel overwhelmed by the demands of the course. In addition they encounter difficulties and pressures associated with adapting to a new environment. In Malaysia a study conducted using the perceived Stress Scale among international students, reported high levels of stress among 40% of the students with no significant relationship between age, gender and perceived stress. These demands, combined with the absence of family support and distance from home and the strains of studying in a foreign country increases the potential likelihood of international students suffering from stress. Similarly in a study performed among International students in Australia, high levels of stress were found among international students which were strongly correlated to acculturation hardships and psychological distress. Most students reported some degree of cultural stress related to absence of family and a familiar environment. A further study showing similar results was carried out among Korean international students in USA. To conclude, it can be purposed that international students...
experience stress and feelings of discomfort, displacement and distress while living and studying in foreign countries.

In recent times there is a growing trend for students of medicine to pursue their studies in foreign medical institutions for various reasons. Medical education is considered to be one of most demanding and stressful courses undertaken at tertiary level due to its six year duration and the intense study required to complete the course. (13) A systematic review of 40 studies concluded that, in general, psychological distress and anxiety in medical students are higher than age-matched peers in the general population. (14) In research carried out among Thai students a majority of students suffer from some degree of stress with only a small number suffering from very high levels of stress. (15) An additional research conducted among Finish students also showed that students suffer from stress without significant gender differences. (16) In both studies the major cause of stress was the academic pressure and the levels of stress varied throughout their years of study, which is in line with the Lithuanian study conducted in LSMU. (7) Accordingly, stress affects many students worldwide causing possible physical and mental distress. It can be ascertained from the literature that most international medical students endure some levels of stress during their years of training related to the academic demands of the course and the hardships connected to acculturation in a new environment. The stress is not significantly greater among one gender than the other and the stress tends to vary from one year to another.

2. Lifestyle indicators among international students

Much has been written about lifestyle in modern times and by all intents it is a concept that encompasses many facets of a person's personality and mode of life. The term was coined by the Austrian psychologist Alfred Adler who proposed the meaning of "a person's basic character as established early in childhood". (17) Lifestyle habits determine a person's wellbeing and habits formed early in life tend to continue throughout life. Lifestyle can be healthy or unhealthy based on your food choices, activity level and general behavior. In many cases negative life style habits are adopted by students in order to combat the stress of academic life in a foreign country. Research suggests an association between increased stress and the development of harmful lifestyle habits, also known as health risk factors. Psychological distress portrayed by mood changes and general lack of wellbeing has also been recorded. Students subject to persistent levels of stress throughout their academic years may develop deleterious lifestyle behaviors such as sleep disturbances, nutritional imbalance, lack of physical activity and substance abuse all resulting in impaired quality of life. Lifestyle habits determine a person's wellbeing. Habits formed early in life tend to continue throughout life.
Therefor international students, laboring under a heavy academic load compounded by the hardships of acculturation are at risk of adopting health risk behaviors which may cause physical and psychological damage throughout their lives. (18) The presence of stress can be blamed for many physical and psychological problems among students and attempts have been made to measure its relationship to their positive or negative lifestyle choices. (19)(20) However research has been lacking on how stress is linked to lifestyle choice indicators such as sleep, diet, alcohol, smoking, drug use and over the counter medicines, physical activity and mood, among international students.

2.1 Sleep

Good quality of sleep is a major factor in one’s well being. Lack of sleep may lead to burn out and disturb a person’s ability to concentrate and to perform to the best of his ability. A person in distress may suffer changes in sleep habits and find it more difficult to fall asleep at night. Stress can lead to sleep disturbances such as insomnia and daytime. (21) Furthermore it is believed that sleep disorders are correlated with stress and have an effect on academic performance, as shown in a survey among Pakistan medical students which found a very high prevalence of academic stress and poor sleep quality among medical students. (22) Another cross sectional study conducted among students at University of health science in Riyadh, indicated that students who are not suffering from stress are less likely to have poor sleep and the risk of poor sleep quality was almost four times higher in students who had lower academic performance and reported of being stressed. (23) Thus the results of both studies implicate that there is a correlation between stress and the quality of sleep among students.

2.2 Diet

International students face many dietary challenges while trying to adapt to new culture. Some of these challenges include the limitation in the food availability and access, and consequences of dietary habit changes specifically related to international students’ nutrition as a result of adapting to the new culture. The sedentary student lifestyle resulting from tight and overload schedule, long hours of studies and reduced levels of physical activity may result in weight gain and obesity. (24) A cross sectional research conducted among international Chinese students studying in South Korea examined the changes in dietary behavior and food consumption patterns found that students practiced unhealthy dietary behaviors when they moved to South Korea compared to when they lived in China. Moreover weight gain and obesity was also significantly increased, more among male international students. (25) These results are in line with results of a study carried out among Indian students which also showed obesity to be more prevalent among male students compared to female students. (26)
2.3 Alcohol

Alcohol consumption is known to have a relaxant effect on the body and increase self esteem. Research supports that drinking alcohol reduces the levels of anxiety among young adults and gives a sense of relaxation and good general feeling. (27) Many students turn to alcohol as a relief from demands and escape from the study environment and a refuge for support in the company of friends. However, alcohol is also known for its various negative affects and hazardous consequences, often leading to impaired judgment and a decline in academic performance among students. Harmful physiological and emotional effects place the students at risk for negative influence on their academic performance, general emotional state and can develop a dependency which in future will be hard to reverse. (28) Alcohol use is a central part of students socializing and pass time during college years and rising evidence indicates increasing amounts of substance abuse among medical students. Some students might replace the feeling of loneliness and isolation caused by absence of family and friends by socializing with friends in places of entertainment. This is supported by research conducted among Belgian students which showed that students who socialized more and spend more time around college campus, involved in college activities tend to drink more alcohol. (29) Research shows that excessive drinking and binge drinking among medical students is common. A study carried out in Wolaita Sodo University in Ethiopia shows that alcohol is one of the coping strategies employed to deal with stress among students. (30) Similarly a study conducted among Irish and English students concluded that alcohol continues to be the most prevalent Public health issue among university students. (31)

2.4 Smoking

Tobacco smoking remains a serious threat to global health with close to 6,000,000 deaths from diseases related to cigarette smoking around the world. (WHO 2015) Smoking is common among health professions students in the Baltic countries. In Lithuania 16.5% of adolescence report of being current smokers (32) and smoking among adults has traditionally been high. (WHO global report 2016) Cigarette use among medical students is of particular concern because medically educated people play a leading role in the development of overall public health policy and the prevention of tobacco use in the society. A research carried out in Oxford university analyzing numerous trials by investigating the effectiveness of training health care professionals to deliver smoking cessation interventions to their patients. Results showed that Health care professionals who had received training were more likely to preform tasks of smoking cessation than untrained. (33) This is an important factor in increasing awareness among health care professionals which in future will increase global health among population. Especially when taking into account that literature supports that
smoking among students is prevalent as demonstrated in two studies conducted among students in Tuzla University and in Italy. (34) (35)

2.5 Drug Use and Over The Counter Medications

It is difficult to establish the current extent of substance abuse among medical students due to lack of up to date data. However, Over the counter medication are generally used for wide range of health complaints pain and fever reduction and are available without prescription and can be bought in any pharmaceutical. This type of drugs are on the rise because they are easily available, don’t require a doctors prescription and students tend to consider them as harmless because they don’t have a proper understanding of how the drugs affect their health. However these drugs can be misused for long term periods and cause a harmful outcome. (36)

2.6 Physical activity

The effect of exercise on health and well being is a vastly studied issue throughout literature. Furthermore much research has been done in an attempt to prove the beneficial effects of exercise on humor and self esteem, and in reducing levels of stress. (37)(38) In a study that was carried out among college students in a Midwest public university, it was reported that students were more stressed if they did not engage in physical activity. This comes to show that physical activity is associated with decreased level of stress and plays a positive role in reducing stress levels. (39)

2.7 Mood

Psychological distress is an integral part of a student’s life, many studies report of the presence of anxiety, mood changes and depression among medical students. Such high levels of stress may interfere with the quality of the student’s academic performance and general satisfaction with life. College students usually experience high stress from multiple sources, which cause unhealthy behaviors and poor mental health outcomes. Research has shown that high stress levels in college are also associated with depression and anxiety. In a survey conducted in Fayoum University, 64% of students reported of depressive mood (40) this is in concomitant to a study conducted in Pakistan at which 70% of students reported of suffering from anxiety and depression. (41) In addition, In a research carried among international US students studying in Loyola University in Rome, results revealed that higher levels of psychological distress and loneliness were associated with poorer functioning among international students studying abroad. (42)
It can be surmised from the literature that a great amount of stress comes to bear on international students during their academic years due to the demands of the course and the difficulties of acculturation. Such stress may be have a bearing on the lifestyle choices of students possibly influencing sleep and eating habits, substance and medicine use, levels of physical activity and mood. Many studies have investigated the association between stress and lifestyle among various populations yet little research has been carried out among international students in Lithuania. Therefore this study attempts to ascertain a link between stress and lifestyle behaviors among international students at LSMU University.
10. METHODOLOGY

This was a cross-sectional epidemiological study conducted in 2017 at LSMU University. The sample for this study was conducted only among international students in the healthcare professions (medicine, odontology and veterinary faculty), without distinction of sex or ethnicity. The study was carried out after obtaining clearance from the university and ethical committee. Students were chosen randomly from first to sixth year of their study. The participants were notified that the questionnaire was randomized and anonymous and that it would not reflect in any way on their progress in their medical course.

Oral consent was received before the distribution of questionnaires in which the students agreed to self-administer the questionnaire. The questionnaires were handed out randomly to international students at the library. Students were chosen from first to sixth year of their study. The students were given an introduction and explanation and were asked to fulfill the instructions. The process of filling out the questionnaire took between 30 minutes in average for each student.

The instruments used to carry out the research were two validated scales measuring stress and lifestyle habits among international students. Stress was assessed using the 10- item Perceived stress scale (PSS) a widely used measure of stress. The students were assessed with respect to the perception of life as being uncontrollable, unpredictable, and overloading and also how often they felt confident and reassured of his abilities within the last month. Each item is rated on a 4-point likert scale response format ranging from “never” (0) to “very often” (4). The total PSS scores were calculated by reversing the scores on the four positive items and then adding the responses to all 10 items for each participant. Questions 4, 5, 7, and 8 were the positively stated items. The PSS scores ranged from 0 to 40, with the high scores 27-40 indicating higher levels of perceived stress, score of 13-27 indicating moderate levels of perceived stress and the lower scores 0-13 indicating lower levels of stress. The 10- item PSS version was chosen due to its proved validity and good psychometric scoring. Lifestyle variables were measured by the Fantastic questionnaire which includes 25 closed questions that explore nine categories on physical, psychological, and social lifestyle components, identified with the acronym FANTASTIC: F - family and friends, A - physical activity/affiliation, N - nutrition, T - tobacco, A - alcohol and other drugs, S - sleep/stress, T - work/type of personality, I - insight, and C= career satisfaction; (adapted to academic satisfaction for the purpose of this study.) The items have five options as answers, with numeric values ranging from 0 to 4; O= “almost never , 1= seldom, 2= sometimes, 3=very often, 4= almost always. The sum of the scores from all categories derives the total score, which ranges from 0 to 100 points, arranging the participant into five levels of behavior: 0 to 34 (needs improvement), 35 to 54 (fair), 55 to 69 (good), 70 to 84 (very good), and 85 to 100 (excellent). The higher the score the less need for change required.
**Statistical Analysis**

The results are presented as the mean and standard deviation (SD) for continuous variables with normal distribution, as the interquartile range-IQR (25th; 75th percentiles) for continuous variables with abnormal distribution and as number and percentage of total patients for categorical data. T-test was used for comparison of continuous variables. When the distribution was abnormal, the Mann-Whitney test was applied accordingly. Chi-square test and Fisher's exact test were used for categorical data. Spearman correlation test used for non-parametric data. A two-sided p-value<0.05 was considered as statistically significant. The statistical analysis was performed with SPSS software (version 23.0).
11. RESULTS

Study population
100 students filled questionnaires. Mean age 23.8 (2.9) years. 41% were females and 59% males. Descriptive statistics is shown in the Table 1. Majority of applicants (36%) were in their 3rd year of study. (Fig 1.) Most of the international students applicants were of Israeli nationality (41%) followed by Spain (13%), Sweden (12%), Germany (11%), France (9%) Poland (4%), Ireland (3%), Nigeria (2%) , USA , Greece, Denmark, Turkey, Canada were 1%. As demonstrated in (Fig. 2)

Stress score
Stress score distribution among international medical students is shown in the histogram Fig.3. Mean Stress score was 18.9 (6.1)
Majority of students experienced moderate stress 71%, followed by mild stress 21% and high stress levels (8%). (Fig.4)
There was no statistically significant difference in stress level among students in different years of study. (p=0.3) (Fig.5)
Most of female students reported of having moderate stress (76%) while minority experienced mild (12%) and severe (12%) levels of stress. Similarly, most males experienced moderate stress levels (66%) but had a higher proportion of mild stress (29%) compared to severe stress levels (5%). Figure 5 shows a bar chart of stress levels stratified by gender. There was a larger percentage of women severely stressed compared to men but the difference in stress level between male and female students didn’t reach a statistical significance (p=0.08), according to Fischer’s exact test. (Fig 6.)

There were 38% students aged 25 years and older and 62% students younger than 25 years. Among older than 25 year old students, moderate stress was observed in 76%, mild in 19% and high stress in 5% , relatively.
Majority of students younger than 25 years experienced moderate stress in 69%, mild stress in 11% and high stress in 10 %. The difference in stress severity between the groups of younger and older than 25-year-old students was statistically significant (p=0.04), according Fischer’s exact test. (Fig. 7)
**Lifestyle score**

Life style score distribution among international medical students is shown in (Fig. 8)Median Life style score 64, IQR (58; 69)

62% of students reported of leading a good lifestyle, 24% very good, 13% fair lifestyle and only one student 1% needs improvement.

Females 61% reported of leading good lifestyle versus 7.3% fair and 31.7% very good lifestyle while males 62.7% reported leading a good lifestyle versus 18.6% leading very good lifestyle, 16.9% fair lifestyle and only one 1.7% needs improvement. There was no statistical significance between genders in life style score. P=0.3 (Fig.9)

Among students 25 years and older, 60.5% reported good lifestyle, 26.3% very good, 10.5% fair lifestyle and 2.6% needs improvement.

Students younger than 25 reported good lifestyle 62.9%, very good lifestyle 22.6% ,fair lifestyle (14.5%), relatively. There was no statistical significance between students of different age groups in life style score. P = 0.2 (Fig. 10,11)

**Life Style Components:**

**Smoking:**

Overall 49% of all international students report no smoking at all (for the past 5 years) bringing them to excellent result on FANTASTIC score. Of these students 51% were women and 49% were men.

11% of all international students reported a fair result, of these students, 63.6% men and 36.4% women. 13% of international students need improvement (smoke more than 10 times per week), of which 76.9% men versus 23.1% women. No statistical significance found between genders among smokers. P= 0.3  (Fig. 12)

**Diet:**

49% of students report of maintaining a fair diet, more men than women, 51% and 49% respectively.

28% of students maintain a good diet. Out of these 39.3% and 60.7% of women and men respectively.

3% of students had an excellent diet, with 66.7% males and 33.3% females.

10% of students maintain a diet which need improvement, 60% males and 40% females. No statistical significant difference was found in diet between genders. (P= 0.2) (Fig 13)
Exercise:
30% of students reported fair amount of exercise, out of which women 56.7% and 43.3% men. 6% of students reported excellent exercise results; 66.7% and 33.3% women and men respectively.
23% of all students reported very good score, of which 21.7% women and 78.3% men.
27% of all students need improvement, of which 37% women as opposed to 63% of men. There was a trend of men who need improvement in exercise compared women but it didn’t reach statistical significance. (P=0.07) (Fig.14)

Caffeine Intake:
Caffeine intake related to lifestyle:
High caffeine intake: was among students who reported of having Fair lifestyle (37%), among those, 40.5% women and 59.5% men,
27% of students result good with women 51.9% and men 48.1%.
7% of student result excellent with 42.9% women and 57.1% men.
19% student need improvement, 36.8% women and 63.2% men. There is no statistical significant difference in caffeine intake between genders, p=0.5. (Fig.15)

Sleep:
51% report fair sleeping habits with 41.1% women and 56.9% men.
40% of students report good sleep, 42.5% women and 57.5% men.
7% of student need improvement 14.3% and 85.7% women and men respectively.
2% report excellent sleep with 50% women and 50% men. No statistically significant difference was found in sleep habits between genders. P= 0.5 (Fig.16)

Mood:
50% of students report of fair mood, with 48% women 52% men.
25% report of good mood, 36% and 64% women and men respectively.
21% need improvement 33.3% and 66.7% women and men respectively.
4% report of very good mood, 27% women 75% men. No statistically significant difference was found in mood between genders. P= 0.6 (Fig. 17)

Over the Counter Medication:
65% of students reported of excellent result, with 41.5% women and 58.5% men. 17%, 14% resulted a good and very good score, with 41.2% and 35.7% women respectively. 58.8% and 64.3% men respectively.
Only 1% of students needed improvement, with 100% men. No statistically significant difference was found in over the counter medication usage between genders. P=0.9 (Fig. 18)

**Drugs:**
58% of students result in excellent score. 66.6% women 53.4% men.
30% of student result in good score 30% women and 70% men.
2% of student need improvement, of which 100% were men. No statistically significant difference was found in drugs between genders. P=0.4 (Fig. 19)

**Alcohol:**
40% of students resulted very good score on scale. 42.5% women, 57.5% men.
24% report excellent , 24.7% women and 58.3% men.
27% of students scored fair, 40.7% women and 59.3% men.
2% need improvement , 50% women and 50% men. No statistically significant difference was found in alcohol intake between genders. P= 0.9 (Fig. 21)

**Association between stress level and lifestyle**
The association of stress level and lifestyle assessment among the international medical students is shown in (Fig.22)

A moderate and significant correlation was found between student life style and stress levels, Spearman correlation co-efficient = -0.4, P value  p < 0.001. Showing that an inverse moderate correlation was found between stress and lifestyle. In other words, students enduring high levels of stress had a worse lifestyle.

When revising the components of lifestyle apprised from the FANTASTIC Lifestyle questionnaire and their correlation to stress levels among students, results show overall that close to half the students maintained a fair diet and some maintaining a good healthy diet. Also an association was found between physical activity and stress those who engaged in physical activity experienced less stress. Quality of sleep was positively correlated to levels of stress, thus students who had higher levels of stress had worse quality of sleep. Furthermore, there is a link between stress and bad mood , students endured higher stress levels reported of bad mood. Regarding alcohol consumption a weak but significant correlation was found between alcohol consumption and decreased stress level.
12. DISCUSSION

The results of many studies have revealed that international students suffer from stress presumably caused by academic demand and acculturation strains. (11)(12)(13) This study found that the majority of international students experience moderate degree of stress throughout their years of studies. These results are similar to a research carried out among Bangladesh students which also showed that more than half of students suffer from stress.(43) However, in this research there was no significant difference in levels of stress throughout the different years. This is in contrast to the results of the study in Bangladesh in which students reported of highest levels of stress in the fourth year of study and to the study conducted in Lithuania which reported third year students being the most stressed.(7) Moreover, mostly students in this study suffered from moderate levels of stress and only a minority reported of suffering from severe levels of stress. These results are similar to results of the Thai study which also demonstrated only a small percentage, 2.4% of students suffering from severe levels of stress.(15) In regards of stress and gender, no significant differences were found among stress levels between male and female students, this is inline with results of the Malaysian study which also found no significant difference between stress levels among male and female international students.(10) Regarding severity of stress it is indicated that females and students under 25 years of age experienced highest levels of stress. Students under 25 years of age had significantly higher stress levels, yet gender differences did not reach a statistical significance.

Its interesting to note that the peaks in severe stress levels were among the younger students and female population this may indicate that students find it hard to withstand the demands required to enter higher level education at a young age and females may be suffer from the lack of support provided by home. It may be assumed that women are more susceptible and sensitive to changing environment.

When analyzing Lifestyle factors, a correlation was found between stress level and life style choices as supported in other studies. (20)(24)(29) In this study, results show a positive correlation between exercise and stress. Students who exercised had lower levels of stress. Conversely, in a research among college students in Southeastern US no significant correlation was found in regards to physical activity and stress levels.(38) Though, a research conducted among undergraduate health professional students in the US, demonstrated that students who did not engage in physical exercise reported higher stress levels.(39) This comes to show it is presumable that physical activity is linked to stress levels and might help in mitigating the levels of stress.

Another finding in this study was the positive correlation between sleep and stress levels. Students who had less stress tend to enjoy better quality of sleep. This is concomitant to a research carried out among medical students in King Saudi University which also reported that students
suffering lower levels of stress had better sleep. (23) Another study conducted in Pakistan revealed that students with high levels of stress suffered from poor quality of sleep. (22) This supports the notion that stress can indeed impact on students sleeping patterns and quality of sleep. Some studies found negative dietary habits among international students. Such as the study among international students in South Korea, which showed students adapting negative diet habits upon beginning of studies in a new country. (25) In this study a substantial amount of students, maintained a satisfactory diet however the majority of students didn’t maintain a wholesome diet with some requiring improvement.

Regarding alcohol majority of students did not consume alcohol with only 2% of students reported of consuming alcohol to an exceeding amount. This is in contradiction to the study conducted in Wolaita Sodo University in Ethiopia which reported of almost a third of students consuming alcohol. (30) In addition, a systematic review among 1120 students in Ireland and the UK reported two thirds of students consuming alcohol. (31) Hence, the prevalence of alcohol consumption among students tends to be in higher percentages. This may be attributed to different cultural habits among students, the university in Lithuania is of diverse populations, with a majority from eastern back round which don’t tend to drink as much alcohol. However, it showed that students who did consume alcohol, suffered less stress.

The prevalence of drug use among international students in this study was extremely low such was the use of over the counter medications. Nonetheless, in the Rihade study almost 80% of students reported of using over the counter medication, such as Non-steroidal anti inflammatory drugs for head ache and pain relief. (36) This finding may be due to fact that the students in this study are from health profession faculties meaning they might have higher awareness of the risks portrayed in daily use of medications.

In relation to smoking, 13% of students smoked, these results are lower than found in literature. For instance, a research conducted among students in Tuzla university which demonstrated 28% of smokers (34) and another research carried out among Italian students which reported 35% smokers. (35) Once again, this may be attributed to higher awareness to health among medical students and the risks accredited to smoking. Concerning mood among students in this research, negative mood, such as anxiety, sadness and anger were reported among students with higher stress level. This is in order with the study preformed in Fayoum university which found a correlation between stress and depression. (40)

It is reasonable to assume and the literature abounds there is a link between types of lifestyle habits and varying stress levels among international students. Lifestyle habits developed at this age are often continued into adulthood therefore it is important to instigate awareness regarding college students challenges during their years of study.
This study found that in general students do not feel overly stressed and overall lead a satisfactory lifestyle. It can be deduced from the results of this study that there is an association between lifestyle habits and stress among international students. It is notable that leading positive and healthy lifestyle choices such as exercise and efficient sleep can be used as a tool to help combat stress levels. However, although an association was found, further research to establish a cause-and-effect relationship between stress and lifestyle choices among international students is required.
13. CONCLUSION

Most of students experienced a moderate stress level and reported good life style. A moderate and significant correlation was found between the student life style and stress levels. There was a numerical difference in the stress level in female compared to male students that didn’t reach a statistical significance probably due to small sample size. However severe levels of stress were more prevalent among female students. Students aged 25 and younger experience higher stress level compared to older students. Correlation was found between exercise, sleep quality and lower stress levels. Students engaged more in physical activity experienced less stress and had better quality of sleep. A weak correlation was found between higher stress levels and bad mood. Students who consumed more alcohol were less stressed.
14. PRACTICAL RECOMENDATION

Knowledge of stress and its relation to lifestyle manners can provide healthcare professionals in the university the basis to initiate special programs that can educate students about the inherent pressures of academic and acculturation stress and to provide them with tools to better manage stress. Moreover, some aspects of lifestyle such as caffeine intake, sleep habits, exercise and students who reported of smoking require improvement. This suggest the need to instigate a program to help raise awareness against harmful behaviors.
15. REFERENCES


39. Weismantel KR. Stress and Exercise in Undergraduate Health Professions Students. 2016;


16. ANNEXES

Fig. 1: Years Of study Distribution

Table 1: Descriptive statistics of population

<table>
<thead>
<tr>
<th>Variables</th>
<th>Descriptive statistics</th>
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<tbody>
<tr>
<td>Age, years, mean (SD)</td>
<td>23.8 (2.9)</td>
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<tr>
<td>Women, n (%), 41 (41.4)</td>
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</tr>
<tr>
<td>Years of studying,</td>
<td>3 (2; 5)</td>
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<td>median, IQR (25th; 75th percentiles)</td>
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<tr>
<td>Weight, kg, mean (SD)</td>
<td>70.6 (13.9)</td>
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<tr>
<td>Height, cm, mean (SD)</td>
<td>168.6 (19.2)</td>
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<tr>
<td>Stress score, mean (SD)</td>
<td>18.9 (6.1)</td>
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<tr>
<td>Life style (validated) score,</td>
<td>64 (58; 69)</td>
</tr>
<tr>
<td>median, IQR (25th; 75th percentiles)</td>
<td></td>
</tr>
</tbody>
</table>
Fig. 2: Nationality
Figure 3. Stress score distribution among international medical students.

Figure 4. Stress severity among international medical students
Figure 5. Stress levels of different years of study (P=0.3)

Figure 6. Stress levels stratified by gender (P=0.08)
Figure 7. Stress levels stratified by age categories (P=0.04)

Figure 8: Life Style score distribution among international medical students
Figure 9. Life style assessment stratified by gender (P=0.3)
Figure 10. Life Style 25-year-old and older

Figure 11. Life style 25-year-old and younger
Figure 12. Smoking difference among genders ($P=0.3$)

Figure 13. Gender differences in diet ($P=0.2$)
Figure 14. Gender differences in exercise (P = 0.07)

Figure 15. Caffeine intake differences between genders (P = 0.5)
Figure 16. Sleep habits differences between genders ($P=0.5$)

Figure 17. Mood differences among genders ($P$ value=0.6)
Fig. 18. Over the counter medicines intake difference among genders (P value 0.9)

Figure 19. Drug intake differences among genders (0.4)
Figure 20. Alcohol consumption among different genders (P value=0.9)

Figure 21. Association of stress level and life style among the international medical students
Table 2: Correlation between stress and lifestyle

<table>
<thead>
<tr>
<th></th>
<th>Spearman Correlation coefficient</th>
<th>P-value</th>
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<tbody>
<tr>
<td>Lifestyle (FANTASTIC)</td>
<td>-0.4</td>
<td>&lt;0.001</td>
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<tr>
<td>Diet</td>
<td>-0.16</td>
<td>0.1</td>
</tr>
<tr>
<td>Exercise</td>
<td>-0.5</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Caffeine</td>
<td>0.28</td>
<td>0.004</td>
</tr>
<tr>
<td>Sleep</td>
<td>0.3</td>
<td>0.001</td>
</tr>
<tr>
<td>Depressive mood</td>
<td>0.33</td>
<td>0.001</td>
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<tr>
<td>Alcohol consumption</td>
<td>-0.3</td>
<td>0.002</td>
</tr>
<tr>
<td>Drugs</td>
<td>-0.19</td>
<td>0.06</td>
</tr>
<tr>
<td>OTC</td>
<td>-0.1</td>
<td>0.16</td>
</tr>
<tr>
<td>Smoking</td>
<td>0.25</td>
<td>0.011</td>
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