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Exploring the Level and Sources of Stress among International Students in an Iranian University

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ABSTRACT

Student life stress, characterized by mental pressure arising from the university life demands, is a significant concern. We aimed to investigate stressors faced by students and their coping mechanisms within an Iranian university. Using a cross-sectional design in 2021, we selected 165 international students through simple random sampling. Data were collected using a standardized student life stress questionnaire. The mean score of students' stresses was (63 ± 17), with self-imposed stress being the most prevalent stressor (64%), while conflict was the least prevalent (44%). When examining students' reactions to stressors, the mean score was (64 ± 21), with cognitive reactions being the most common response (68%) whereas behavioral reactions were the least common (38%). There was no significant relationship between students' stress levels and their demographic characteristics. Overall, our study highlights the need for culturally sensitive and tailored support programs for international students, as most participants experienced moderate stress.

Keywords: Higher education, international students, Iran, stressors, student life stress, university.

The global landscape of higher education has witnessed a significant increase in the number of international students pursuing their studies abroad. Over the years, the number of such students has grown to approximately 1.5 million individuals, which is projected to rise to more than seven million by 2025 (UNESCO, 2015; UNESCO, 2019; Davis & Knight, 2021). The decision to study abroad offers diverse benefits, including fostering intercultural understanding, enhancing adaptability to different cultures, and honing foreign language skills (Kristiana et al., 2022). However, university life, with its academic rigors and social dynamics, can be a source of stress and anxiety particularly for international students who often face additional stressors, making their experience more complex (Pei Yun et al., 2022).

Stress, in its essence, arises when an individual perceives an imbalance between the demands of their environment and their ability to cope effectively (Sovic, 2008). International students encounter a unique set of stressors, including acculturation stress stemming from adapting to a new culture, academic stress related to navigating a different educational system, personal and social stress triggered by transition issues, loneliness, and building new relationships, as well as financial worries (Tajvar et al.,2024; Koo et al., 2021; Guo et al.,2011). The impact of stress on students' well-being is profound and can lead to various consequences including physical ailments, abnormal eating habits, increased alcohol consumption and higher prevalence of psychiatric disorders (Guo et al.,2011; Li and Peng,2019; Wichianson et al., 2009; Zack et al., 2007). Furthermore, stress can evoke emotional responses, such as fear, despair, reduced self-confidence, and even suicidal thoughts (Park and Noh, 2018; Glozah,2013; Dvorak et al., 2013). Recognizing these challenges and providing adequate support is crucial for their overall well-being.

In Iran, as in many other countries, the number of international students has been steadily rising. However, research specifically focused on the situation and stress experiences of international students within the country remains limited. This scarcity of research hinders our understanding of the stressors that international students encounter. Consequently, the development of tailored support systems to address their unique needs is impeded. The objective of this study was to explore the levels and sources of stress among international students. By doing so, we aimed to contribute to the existing body of knowledge in this area; inform higher education authorities and policymakers about the challenges faced by international students and facilitate the formulation of effective policies and support programs to ensure the well-being and successful academic journey of these students. The following hypotheses and questions guided this study:

RQ1: What is the levels and sources of stress among international students studying in Iran?

H1: There is a positive relationship between stressors and demographic characteristics of international students**.**

H2: There is a positive relationship between coping reactions to stressors and demographic characteristics of international students.

LITERATURE REVIEW

Higher Education and Globalization

Globalization can be defined as “the flow of technology, economy, knowledge, people, values, ideas……. across borders” (Knight, 2005). So, higher education is seen as one of the main elements in the process of globalization. Meanwhile, globalization has left wide and deep effects on the structure, methods, programs and performance of higher education and universities in the world (Molaei, 2018). It is not only focused on the international movement of students and professors, but considered all the components and elements of the educational systems. On the other hand, globalization puts pressure on the educational system to produce knowledge based with emphasize on human capital and decontextualization, which requires that students, in addition to learning certain knowledge and principles, should be trained to be creative, innovative, flexible, and enable to face and solve complex issues. (Arokiasamy and Nagappan, 2011).

The export of higher education services appeared in the late 1980s and early 1990s and now it is becoming a global industry that matters not only among developed countries but also in the developing countries in the Asia-Pacific region. (Arokiasamy and Nagappan, 2011). SO, in recent decades, the attraction of international students has become one of the main priorities of universities and higher education institutions. Universities in order to earn economic income, improve the quality of education, socio-cultural understanding, reputation and other factors are driven towards this policy. In fact, according to the needs and expectations of international students, universities provide favorable conditions so that they can show their attractiveness to them (Saidi and Falahati, 2021). Although the presence of international students in universities has many positive effects but living and studying in an unfamiliar social and educational culture has confronted international students with various stresses that need to be explored (Tajvar et al., 2024).

Stress in International Students

stress is considered as a generalized physiological and psychological state that is caused by the experience of stressors in the environment (Brown, 2008) Various studies have already shown that stress experiences should not be understood as a culturally basis, but rather that stress is experienced on an individual basis. (Sarros and Densten, 1989; Sovic, 2008). Therefore, coping strategies to deal with stress vary from person to person. What one student sees as a challenge, another may see as a threat (Sovic, 2008). Burns states that "stress occurs when one believes that cannot meet the demands of the environment, it is a subjective self-appraisal of inability to cope, a feeling of being overwhelmed to some extent" (Burns ,1991). In this regard, Rice recognizes three common types of student stressors: 1) personal and social stressors, 2) acculturation stressors among various ethnic groups, and 3) academic stressors (Rice, 1999).

Types of student stressors

Personal and social stressors are considered as transitional issues, loneliness and relationships. international students face to various challenges while separated from their main support system, family, friends, and home, which increase their distress. Consequently, these problems negatively influence to international students' mental health (Koo et al., 2021).

Acculturation tensions are stressors that revolve around acculturation in new environments, feelings of "not belonging" and discrimination. Unlike native students, international students can experience acculturation stress (i.e. stress create by changes while living in various cultures) and adapting issues (Koo et al., 2021). which can be associated with symptoms such as depression, anxiety, anger, identity confusion and social conflict (Kristiana et al.,2022). Berry showed that the degree of stress coping introduced through the acculturation process affects the intensity of the acculturative stress experienced (Berry, 2006). acculturative stress in international students, is significantly related to adapting, academic performance, social connectedness, and mental health (Koo et al., 2021; Lu et al., 2019) and Barry found that individuals who Appropriate resources to overcome acculturative stress have better results in this field than people who do not have adequate coping mechanisms (Berry, 2006).

Academic stressors encompass exam anxiety, workload, and time management. Academic stress is mental and emotional pressure, tension or stress that occurs due to the requirements of university life. Some academic stress is common to all students, as stress comes from being exposed to new educational concepts, adapting to new social environments, and dealing with increased workloads (DeDeyn, 2008). But adapting to the pressure caused by this stress can be more complicated for international students, they adapt to a new educational system and a new cultural environment simultaneously. Experiencing high levels of academic stress not only effect on mental health of international students, but also effect on their adaptation to a new environment. More academic stress leads to less confident and more anxious when living in a new environment (Koo and Tan, 2022).

There are two layers to the academic stress that international students experience: how stressful they find the demands of their role to be, and how well they can cope with these demands. Among this, language barriers, social skills, problem-solving skills, academic skills, and previous knowledge of international students account for a considerable amount of academic stress (Koo and Tan, 2022). Despite numerous studies on stress in international students, studies in this field in Iran are very limited.

METHOD

Study Design

The present study was conducted in 2022 among international students at a central and large university in Tehran. It utilized a quantitative cross-sectional design

with a descriptive-analytical approach. The sample size was calculated using the following formula, considering a confidence coefficient (α-1) of 90%, a standard deviation (S) of 6, and a maximum allowable error (d) of 10. Prior to the main data collection, a pilot study was conducted with ten questionnaires to estimate the standard deviation, which was found to be 6. This calculation resulted in a required sample size of 143 participants, which increased to 165 participants to consider a potential non-response rate of 10%. To ensure a representative sample, participants were sampled using a simple random sampling method with proportional allocation based on the number of international students in each faculty and dormitory.

$$n = \frac{(Z_{1-\alpha/2})^2 \times (S^2)}{d^2} \times \frac{1}{1-f} \times Deff$$

Measurement and Data Collection

Data was collected using the standardized Student Life Stress Questionnaire, consisting of 51 questions grouped into 9 categories. This questionnaire, based on Morris's theoretical model (1990), aimed to assess various stressors in students' lives and their corresponding coping responses (Gadzella & Masten,2005). The questionnaire comprised two parts: the first part addressed academic and personal stressors, including subscales for failure, conflict, changes, pressures, and self-imposed stress. The second part explored coping mechanisms through physiological, emotional, behavioral, and cognitive subscales. The responses were rated on a 5-option Likert scale, ranging from "never" (1) to "most of the time" (5), with higher scores indicating higher stress levels and more negative reactions to stress. The questionnaire was administered in its original English version, and its validity and reliability have been established in previous studies (Fayazfar & Keshavarz ,2009; Bakhshipour *et al*.,2010).

Informed consent was obtained from all participants, and data collection was carried out by trained researchers fluent in English. The researchers coordinated with the educational and student-cultural vice-president of the university's international office, and after obtaining necessary permissions, questionnaires were distributed to international students across various faculties and dormitories. The participants were assured of confidentiality, and they were provided with clear explanations about the study's objectives and the questionnaire completion process.

Data Analysis

The collected data were entered into SPSS 26 software for analysis. Descriptive statistics, including frequency, mean, and standard deviation, were used to summarize the data. Since the data did not follow a normal distribution, non-parametric statistical tests such as Chi-square and Spearman's correlation were used to examine the relationship between independent and dependent

variables. Additionally, multivariate logistic regression was applied to control for potential confounding variables and to further investigate the association between independent and dependent variables.

Ethical Considerations

Ethical approval for the study was obtained from the ethics committee of Iran's ministry of health (IR.TUMS.SPH.REC.1399.113). Throughout the research, participants' rights, privacy, and voluntary participation were respected and prioritized by the researchers.

RESULTS

The age range of the participants (n=165) in the research was 19-45 years and their average age was 24.7 years. The frequency and percentage of other individual characteristics of the participants in the research are shown in Table 1.

Table 1: frequency and percentage of individual characteristics of participants (n=165)

Variables		n	%
Gender	Male	84	50.9
	Female	81	49.1
Marital Status	Single	143	86.7
	Married and living with spouse	14	8.5
	Married but not living with spouse	6	3.6
	Other	2	1.2
Children	Having children	15	9.1
	No children	150	90.9
Major	MD	117	70.9
	DDS	13	7.9
	Nutrition	3	1.8
	Specialty	3	1.8
	Medical physics	1	0.6
	Immunology	2	1.2
	Physiotherapy	4	2.4
	Medical Nanotechnology	2	1.2
	Nursing	6	3.6
	Health Services Management	6	3.6
	Epidemiology	1	0.6
	Virology	1	0.6
	Health Policy	1	0.6
	Pharmacy	3	1.8
	Radiology technology	1	0.6
	Fellowship	1	0.6

Degree	BSc- MD/…	133	80.6
	MSc	14	8.5
	PhD	17	10.3
	Short course	1	0.6
Field of study	Medicine	119	72.1
	Dentistry	13	7.9
	Nutrition	5	3.0
	Public Health	10	6.1
	Rehabilitation	4	2.4
	Advanced Technology in Medicine	2	1.2
	Nursing	7	4.2
	Pharmacy	4	2.4
	Allied Medical Sciences	1	0.6
Length of study in university	< 1 year	11	6.7
	2-3 years	35	21.2
	> 3 years	119	72.1
Earlier university degree	Yes	38	23.0
	No	127	77.0
Place of residence	Dormitory	147	89.1
	Renting a house	15	9.1
	Owing a house	2	1.2
	Other	1	0.6
TOTAL		165	100.0

Table 2: Frequency, percentage, mean and standard deviation of stressors and reaction to them in general and according to their subcategories among international students (n=165)

Rate your overall level of stress as
1 = Mild [23(13.9%)] 2 = Moderate [126(76.4%)] 3 = Severe [16(9.7%)]

No.	I. STRESSORS:	Never (1)	Seldom (2)	Occasionally (3)	Often (4)	Most of the time (5)
	A. As a student: (Frustrations)					
1	I have experienced frustrations due to delay in reaching my goal	18(10.9)	43(26.1)	54(32.7)	34(20.6)	16(9.7)
2	I have experienced daily hassles which affected me in reaching my goals	26(15.8)	42(25.5)	50(30.3)	27(1.4)	20(12.1)

3	I have experienced lack of sources (money for auto, books, etc.)	34(20.6)	42(25.5)	48(29.1)	21(12.7)	20(12.1)
4	I have experienced failures in accomplishing the goals that I set	28(17.0)	49(29.7)	45(27.3)	25(15.2)	18(10.9)
5	I have not been accepted socially (became a social outcast)	79(47.9)	40(24.2)	28(17.0)	12(7.3)	6(3.6)
6	I have experienced dating frustrations	83(50.3)	37(22.4)	22(13.3)	12(7.3)	11(6.7)
7	I feel I was denied opportunities in spite of my qualifications	62(37.6)	43(26.1)	33(20.0)	13(7.9)	14(8.5)
TOTAL (Range 7-35): N= 165, M=17.35, SD=21.93, Med=6.06, min=7, Max= 35						
	B. I have experienced conflicts which were: (Conflicts):					
8	Produced by two or more desirable alternatives	48(29.1)	60(36.4)	41(24.8)	8(4.8)	8(4.8)
9	Produced by two or more undesirable alternatives	52(31.5)	55(33.3)	35(21.2)	15(9.1)	8(4.8)
10	Produced when a goal had both positive and negative alternatives	42(25.5)	56(33.9)	41(24.7)	21(12.7)	5(3.0)
TOTAL (Range 3-15): N= 165, M=6.7, SD=2.85, Med=6.0, min=3, Max= 15						
	C. I have experienced pressures: (Pressures)					
11	As a result of competition (on grades, work, relationships with spouse and/or friends)	30(18.2)	43(26.1)	49(29.7)	25(15.2)	18(10.9)
12	Due to deadlines (papers due, payments to be made, etc.)	17(10.3)	35(21.2)	45(27.3)	39(23.6)	29(17.6)
13	Due to an overload (attempting too many things at one time)	20(12.1)	33(20.0)	57(34.5)	34(20.6)	21(12.7)
14	Due to interpersonal relationships (family and/or friends' expectations, work responsibilities)	37(22.4)	41(24.8)	50(30.3)	23(13.9)	14(8.5)
TOTAL (Range 4-20): N= 165, M=11.54, SD=3.81, Med=12, min=4, Max= 20						
	D. I have experienced: (Changes)					
15	Rapid unpleasant changes.	37(22.4)	39(23.6)	49(29.7)	21(12.7)	19(11.5)
16	Too many changes occurring at the same time	22(13.3)	55(33.3)	46(27.9)	20(12.1)	22(13.3)
17	Changes which disrupted my life and/or goals	31(18.8)	46(27.9)	41(24.8)	22(13.3)	25(15.2)
TOTAL (Range 3-15): N= 165 , M=8.24, SD=3.41, Med=8, min=3, Max= 15						
	E. As a person: (Self-imposed)					
18	I like to compete and win	16(9.7)	21(12.7)	34(20.6)	37(22.4)	57(34.5)
19	I like to be noticed and be loved by all.	26(15.8)	31(18.8)	47(28.5)	23(13.9)	38(23.0)

20	I worry a lot about everything and everybody.	28(17.0)	41(24.8)	47(28.5)	22(13.3)	27(16.4)
21	I have a tendency to procrastinate (put off things that have to be done).	28(17.0)	35(21.2)	41(24.8)	27(16.4)	34(20.6)
22	I feel I must find a perfect solution to the problems I face.	11(6.7)	27(16.4)	40(24.2)	34(20.6)	53(32.1)
23	I worry and get anxious about taking tests.	26(15.8)	27(16.4)	4(27.9)	32(19.4)	34(20.6)
TOTAL (Range 6 - 30): N= 165, M=19.26, SD=5.76, Med=19, min=6, Max= 30						
TOTAL STRESSORS (Range 23- 115): N= 165 , M=63.16, SD=16.92, Med=62, min=25, Max= 115						
No.	**II. REACTIONS TO STRESSORS:**	Never (1)	Seldom (2)	Occasionally (3)	Often (4)	Most of the time (5)
	F. During stressful situations, I have experienced the following:(Physiological)					
24	Sweating (sweaty palms, etc.)	65(39.4)	30(18.2)	30(18.2)	22(13.3)	18(10.9)
25	Stuttering (not being able to speak clearly)	64(38.8)	35(21.2)	36(21.8)	16(9.7)	14(8.5)
26	Trembling (being nervous, biting finger-nails, etc.)	56(33.9)	32(19.4)	34(20.6)	23(13.9)	19(11.5)
27	Rapid movements (moving quickly from place to place)	59(35.8)	25(15.2)	40(24.2)	22(13.3)	19(11.5)
28	Exhaustion (worn out, burned out)	39(23.6)	37(22.4)	40(24.2)	26(15.8)	23(13.9)
29	Irritable bowels, peptic ulcers, etc.	78(47.3)	26(15.8)	22(13.3)	15(9.1)	24(14.5)
30	Asthma, bronchial spasms, hyperventilation	101(61.2)	20(12.1)	29(17.6)	10(6.1)	5(3.0)
31	Backaches, muscle tightness, (cramps), teeth-grinding	96(58.2)	15(9.1)	28(17.0)	16(9.7)	10(6.1)
32	Hives, skin itching, allergies	94(57.0)	26(15.8)	23(13.9)	13(7.9)	9(5.5)
33	Migraine headaches, hypertension, rapid heartbeat	69(41.8)	29(17.6)	29(17.6)	19(11.5)	19(11.5)
34	Arthritis, overall pains	110(66.7)	16(9.7)	24(14.5)	9(5.5)	6(3.6)
35	Viral infections, colds, flu	109(66.1)	24(14.5)	21(12.7)	8(4.8)	3(1.8)
36	Weight loss (cannot eat)	91(55.2)	19(11.5)	27(16.4)	18(10.9)	10(6.1)
37	Weight gain (eat a lot)	89(53.9)	25(15.2)	23(13.9)	10(6.1)	18(10.9)
TOTAL (Range 14-70): N= 165, M=30, SD=11.83, Med=29, min=14, Max= 70						
	G. When under stressful situations, I have experienced: (Emotional)					
38	Fear, anxiety, worry	22(13.3)	28(17.0)	51(30.9)	30(18.2)	34(20.6)
39	Anger	37(22.4)	35(21.4)	43(26.1)	30(18.2)	20(12.1)
40	Guilt	48(29.1)	32(19.4)	36(21.8)	32(19.4)	17(10.3)
41	Grief, depression	29(17.6)	38(23.0)	40(24.2)	28(17.0)	30(18.2)
TOTAL (Range 4-20): N= 165, M=11.49, SD=4.39, Med= 12, min= 4, Max= 20						
	H. When under stressful situations, I used to: (Behavioral)					
42	Cry	66(40.0)	23(13.9)	31(18.8)	20(12.1)	25(15.2)
43	Abuse others (verbally and/or physically)	120(72.7)	18(10.9)	16(9.7)	5(3.0)	6(3.6)

44	Abuse myself	100(0.6)	23(13.9)	20(12.1)	17(10.3)	5(3.0)
45	Smoke excessively	100(0.6)	32(19.4)	17(10.3)	9(5.5)	7(4.2)
46	Have irritable acts towards others	100(0.6)	32(19.4)	17(10.3)	9(5.5)	7(4.2)
47	Attempt suicide	137(83.0)	9(5.5)	9(5.5)	6(3.6)	4(2.4)
48	Use defense mechanism	85 (51.5)	33(20.0)	25(15.2)	12(7.3)	10(6.1)
49	Separate myself from others	44(26.7)	26(15.8)	26(15.8)	31(18.8)	38(23.0)
TOTAL (Range 8-40): N= 165, M=15.37, SD=6.33, Med= 14, min= 8, Max= 40						
I. With reference to stressful situations, I have: (Cognitive)						
50	Thought and analyzed on how stressful the situations were.	11(6.7)	27(16.4)	43(26.1)	54(32.7)	30(18.2)
51	Thought and analyzed whether the strategies I used were most effective or not.	10(6.1)	31(18.8)	42(25.5)	48(29.1)	34(20.6)
TOTAL (Range 2-10): N= 165 , M=6.78, SD=2.18, Med= 7, min= 2, Max= 10						
TOTAL REACTIONS TO STRESSORS (Range: 28- 140): N= 165 , M=63.66, SD=20.89, Med= 62.0, min= 29, Max= 140						

Table 3 shows the relationship between individual characteristics of international students and stressors in general and according to its subcategories. There was no significant relationship between the level of stressors in general and the students' characteristics. Nevertheless, a statistically significant relationship was observed between “Frustrations” and gender (P=0.023), so that this type of stressor was significantly more among male than female students. Also, a statistically significant relationship was observed between the level of "pressures" and "changes" with the two variables of “age” and “field of study”; with increasing in age, the level of pressures (P=0.032) and changes (P=0.022) decreased, and medical and dental students have experienced more stress caused by pressures (P=0.002) and changes (P=0.03) than students in other fields of study. In addition, there was a significant relationship between the "self-imposed" stressor and the “length of study” (P < 0.001); the level of stress in students who had been studying for less than one year was significantly more than the other two groups, also people who had been studying for more than three years experienced more stress than the group who had been studying for 2 to 3 years.

Table 3: The relationship between total score of stressors and its subcategories with individual characteristics of the participants

		Total Stressors		**Frustrations**		**Conflicts**		**Pressures**		**Changes**		**Self-imposed**	
Range of scores		**(23- 115)**		**(7-35)**		**(3-15)**		**(4-20)**		**(3-15)**		**(6 - 30)**	
	N	**Mean (SD)**	**P.V.**	**Mean (SD)**	**P.V.**	**Mean (SD)**	**P.V.**	**Mean (SD)**	**P.V.**	**Mean (SD)**	**P.V.**	**Mean (SD)**	**P.V.**
Age (R)	165	-0.09	0.25	-0.07	0.32	-0.10	0.17	- 0.16	0.032	- 0.17	0.022	0.03	0.66
Gender													
Men	84	64.58 (16.62)	0.27	18.40 (6.34)	0.02	7.00 (2.84)	0.28	11.34 (3.56)	0.49	8.36 (3.36)	0.62	19.46 (5.44)	0.65

Women	81	61.70 (17.20)		16.25 (5.58)		6.51 (2.86)		11.75 (4.07)		8.11 (3.48)		19.06 (6.11)		
Marital Status														
Single	143	62.93 (16.72)	0.79	17.37 (5.89)	0.13	6.63 (2.75)	0.10	11.60 (3.64)	0.08	8.25 (3.42)	0.52	19.06 (5.89)	0.74	
Married and living with spouse	14	63.35 (18.54)		17.42 (6.68)		7.07 (3.33)		11.28 (4.95)		8.00 (3.16)		19.57 (4.75)		
Married but not living with spouse	8	67.12 (19.29)		16.75 (8.54)		8.50 (3.54)		11.00 (3.20)		8.50 (4.14)		22.37 (4.65)		
Children														
Having children	15	63.40 (18.40)	0.95	16.53 (6.98)	0.58	7.13 (3.39)	0.60	11.40 (4.79)	0.87	8.06 (3.45)	0.83	20.26 (4.9)	0.48	
No children	150	63.14 (18.83)		17.43 (5.98)		6.72 (2.80)		11.56 (3.72)		8.26 (3.42)		19.16 (5.84)		
Major														
MD	117	65.13 (16.72)	0.40	17.64 (6.08)	0.95	7.01 (2.86)	0.45	11.92 (3.48)	0.002	8.76 (3.47)	0.03	19.77 (5.48)	0.35	
DDS	13	59.53 (15.11)		17.53 (5.14)		6.23 (2.27)		11.92 (3.54)		8.00 (2.27)		15.84 (4.94)		
Others	35	57.94 (17.31)		16.28 (6.34)		6.11 (2.93)		10.14 (4.65)		6.57 (3.06)		18.82 (6.60)		
Degree														
BSc/MD/DDS	134	64.24 (16.44)	0.23	17.66 (6.04)	0.94	6.94 (2.83)	0.73	11.76 (3.62)	0.15	8.55 (3.40)	0.35	19.30(5.61)	0.57	
MSc	14	58.71 (19.15)		16.64 (5.70)		5.42 (2.40)		10.64 (4.16)		7.14 (3.41)		18.85(7.45)		
PhD	17	58.35 (18.32)		15.47 (6.43)		6.41 (3.14)		10.52 (4.83)		6.64 (2.99)		19.29(5.79)		
Length of study in university														
< 1 year	11	62.72 (13.64)	0.28	15.81 (4.93)	0.16	4.81 (2.13)	0.27	12.36 (4.31)	0.10	8.45 (4.00)	0.39	21.27(5.65)	<0.0 01	
2-3 years	35	59.22 (17.69)		16.65 (6.13)		6.28 (2.89)		10.28 (4.46)		7.31 (3.17)		18.68(6.72)		
> 3 years	119	64.36 (16.90)		17.69 (6.13)		7.08 (2.82)		11.84 (3.50)		8.49 (3.40)		19.25(5.47)		
Earlier university degree														
Yes	39	61.15 (18.36)	0.39	16.68 (6.21)	0.48	6.34 (2.97)	0.29	10.71 (4.47)	0.10	7.36 (3.41)	0.06	20.05(6.51)	0.37	
No	126	63.86 (16.52)		17.46 (5.9)		6.89 (2.82)		11.84 (3.53)		8.53 (3.37)		19.11(5.46)		
Place of residence														
Dormitory	147	63.66 (17.40)	0.68	17.44 (6.14)	0.60	6.78 (2.91)	0.61	11.65 (3.78)	0.96	8.38 (3.48)	0.78	19.39(5.93)	0.79	
Renting a house	15	58.26 (11.85)		16.46 (5.62)		6.60 (2.38)		10.20 (4.19)		7.33 (2.69)		17.66(4.15)		
Owing a house	3	65.50 (17.67)		17.50 (7.77)		6.50 (3.53)		12.00 (4.24)		6.50 (3.53)		23.00(1.41)		

Note: Pearson's correlation test was used to examine the relationship between age and stress level, and t-test and ANOVA were used to examine the relationship between other individual characteristics and stress level.

Table 4 shows the relationship between individual characteristics of international students and coping reactions to stressor factors in general and according to its

subclasses. Our findings indicated a significant relationship between age and field of study in coping reactions to stress, encompassing all types except behavioral reactions; as age increased, the occurrence of negative reactions to stressors decreased significantly (P=0.014). Additionally, medical students exhibited more negative reactions than their peers (P=0.008), displaying all reaction types except behavioral reactions. Also, significant associations were observed between degree level and prior university experience in coping reactions, particularly related to physical and emotional responses; MD and undergraduate students exhibited more negative reactions to stressors both overall (P=0.053) and specifically in terms of physical (P=0.019) and emotional (P=0.040) responses compared to master's and PhD students. Furthermore, individuals with prior university experience displayed more pronounced negative reactions to stressors, both overall (P=0.024) and specifically in terms of physical (P=0.010) and emotional (P=0.035) responses.

Table 4: The relationship between total score of coping reactions to stressors and its subcategories with individual characteristics of the participants

		Total Reactions		**Physiological**		**Emotional**		**Behavioral**		**Cognitive**	
Range of scores		**(28- 140)**		**(14-70)**		**(4-20)**		**(8-40)**		**(2-10)**	
	N	**Mean (SD)**	**P.V.**	**Mean (SD)**	**P.V.**	**Mean (SD)**	**P.V.**	**Mean (SD)**	**P.V.**	**Mean (SD)**	**P.V.**
Age (R)	165	-0.19	0.014	-0.18	0.019	-0.18	0.019	-0.10	0.16	-0.15	0.044
Gender											
Men	84	64.48 (22.76)	0.60	30.66 (12.98)	0.46	11.33 (4.43)	0.62	15.73 (7.10)	0.45	6.75 (2.11)	0.82
Women	81	62.80 (18.85)		29.30 (10.55)		11.66 (4.36)		15.00 (5.43)		6.82 (2.27)	
Marital Status											
Single	143	64.34 (20.74)	0.55	30.56 (11.77)	0.28	11.69 (4.43)	0.33	15.29 (6.28)	0.72	6.79 (2.22)	0.62
Married and living with spouse	14	58.57 (26.06)		26.92 (13.85)		10.00 (3.86)		15.21 (8.36)		6.42 (2.10)	
Married but not living with spouse	8	60.37 (12.62)		25.25 (7.88)		10.62 (4.34)		17.12 (2.16)		7.37 (1.76)	
Children											
Having children	15	58.40 (25.12)	0.30	26.80 (13.51)	0.27	9.86 (3.77)	0.13	15.26 (8.06)	0.94	6.46 (2.03)	0.55
No children	150	64.18 (20.44)		30.32 (11.65)		11.66 (4.42)		15.38 (6.16)		6.82 (2.20)	
Major											
MD	117	66.87 (20.38)	0.008	31.92 (11.71)	0.004	12.18 (4.47)	0.006	15.61 (6.35)	0.72	7.14 (1.99)	0.002
DDS	13	55.00 (13.57)		25.61 (7.78)		9.76 (3.08)		14.38 (4.01)		5.23 (2.68)	

Others	35	56.14 (22.37)		25.20 (11.90)		9.82 (3.97)		14.94 (7.00)		6.17 (2.29)	
Degree											
BSc/MD/DDS	134	65.54 (20.16)	0.053	31.23 (11.57)	0.019	11.90 (4.39)	0.040	15.50 (6.28)	0.85	6.90 (2.19)	0.30
MSc	14	56.35 (19.36)		25.28 (9.71)		10.21 (4.13)		14.85 (4.99)		6.00 (2.25)	
PhD	17	54.82 (25.11)		24.17 (13.32)		9.35 (3.96)		14.76 (.84)		6.52 (2.05)	
Length of study in university											
< 1 year	11	61.54 (21.49)	0.42	27.81 (10.88)	0.17	11.36 (4.63)	0.55	15.36 (5.88)	0.97	7.00 (2.48)	0.49
2-3 years	35	59.85 (22.08)		27.05 (12.29)		10.80 (4.10)		15.60 (6.73)		6.40 (2.35)	
> 3 years	119	64.97 (20.27)		31.06 (11.70)		11.71 (4.46)		15.31 (6.30)		6.88 (2.11)	
Earlier university degree											
Yes	39	57.18 (23.45)	0.024	25.78 (12.53)	0.010	10.23 (4.20)	0.035	14.78 (7.18)	0.48	6.36 (2.28)	0.17
No	126	65.86 (19.60)		31.39 (11.30)		11.93 (4.35)		15.61 (6.06)		6.92 (2.16)	
Place of residence											
Dormitory	147	64.73 (21.24)	0.21	30.60 (12.05)	0.23	11.74 (4.47)	0.10	15.48 (6.44)	0.79	6.89 (2.21)	0.33
Renting a house	15	53.06 (15.51)		24.26 (8.87)		9.00 (2.85)		13.93 (5.45)		5.86 (1.92)	
Owing a house	3	64.00 (14.73)		29.00 (7.21)		12.00 (3.00)		17.00 (5.56)		6.00 (1.00)	

Note: Pearson's correlation test was used to investigate the relationship between age and how to react to stressful factors, and t-test and ANOVA were used to investigate the relationship between other individual characteristics and how to react to stressful factors.

Finally, according to our research, the results from both the Linear Regression test and the Logistic Regression test indicated no significant relationship between students' characteristics and their coping reactions to stressors or the overall stress level.

DISCUSSION

According to the findings, the average stress score among international students was 63 ± 17. Approximately 10% of them experienced severe stress, while 76% reported moderate stress, and 14% had mild stress. Comparing this to two studies conducted on domestic students in Iran, 50.9% and 57% of domestic students

were found to have moderate stress (Vahedi et al.,2014; Nikanjam et al.,2016). In another study by Gadzella and Masten (2005), international students self-reported their stress levels; 18 individuals rated their stress as mild, 194 as moderate, and 61 as severe. Across all these studies, a higher percentage of students consistently experienced moderate stress. This aligns with our own findings with that of a large university in North Carolina, where many students fell within the moderate stress range (Goff,2011).

Among the various stressors, the highest frequency was related to self-imposed stress (64.2%) and pressures (57.7%) in our study. These findings are consistent with other research that highlights self-imposed stress and external pressures as common stressors for students (Vahedi et al.,2014; Nikanjam et al.,2016; Goff, 2011; Misra et al.,2000). International students face additional pressures related to academic performance, adaptation to foreign culture, and financial resources (Guo et al.,2019). Acculturation stress among international students can manifest as symptoms such as depression, anxiety, anger, identity confusion, and social conflict (Koo et al.,2021). Furthermore, cultural stress significantly impacts adjustment, academic performance, social relationships, and mental health among international students (Luo et al.,2019). A study at Jahangirnagar University, Bangladesh, revealed that 59.5% of international students identified relationship conflict as their primary source of stress (Islam et al.,2018). In summary, stress sources for international students include racial discrimination, differences in weather and food, language barriers, separation from family, dietary restrictions, financial constraints, reduced social interaction, changing roles and positions, and differences in education systems (Guo et al.,2019; Koo et al.,2021).

According to the study results, the average stress score for participants was 64 ± 21. When considering the type of reactions, cognitive reactions were the most frequent (68%), followed by emotional reactions (57.5%), and the least common were behavioral reactions (38%). These findings align with previous research (Vahedi et al.,2014; Nikanjam et al.,2016; Goff,2011; Misra et al.,2000), which also indicates that students tend to exhibit more cognitive and emotional reactions to stressors rather than behavioral or physiological responses. Both emotional and physiological reactions to stressors can have implications for mental and physical well-being. It's essential to recognize that stress affects individuals holistically (Vahedi et al.,2014).

In our current study, we found no significant relationship between overall stress levels and individual characteristics among students. However, specific associations emerged for example between gender and frustrations; male students reported significantly more frustrations than female students. This contrasts with some studies that suggest female students generally experience higher stress levels than males (Goff,2011; Msengi,2007; Zascavage et al.,2012; Misra et al.,2000). Interestingly, in a Ghanaian study, men reported more academic frustrations and self-imposed stress than women, which aligns with our findings (Glozah,2013). These variations may be influenced by cultural norms, social roles, and gender expectations. For instance, societal pressure often places male

children in the role of "breadwinners," leading to self-imposed stress and frustrations related to academic performance (Glozah,2013).

Age, field of study, and pressures/changes were also found to be correlated with each other; as students age, their experience of pressures and changes tends to decrease. Additionally, students with less than one year of education and those in medical and dental fields reported higher levels of pressures and changes. Acculturation stress studies, especially among international students, highlight predictors such as age, length of stay in the host culture, and travel experience (Akhtar et al.,2010; Luciano,2012). Similarly, a Midwestern U.S. university study found that first-year students experience more stress than their senior counterparts (Zascavage et al.,2012).

The findings from our study revealed significant associations between age, field of study, degree, and previous university experience with individuals' reactions to stress. As individuals age, the negative reactions to stressors tend to decrease. This suggests that older students may develop better coping mechanisms or resilience over time. Also, Medical, professional doctoral, and undergraduate students exhibited higher negative reactions to stressors compared to master's and PhD students. The specific demands and pressures within different fields of study likely contribute to these variations. Additionally, students who had an earlier university degree expressed more negative reactions to stressors than those without such prior experience. This highlights the impact of previous educational background on stress responses. Interestingly, our findings align with a study conducted in Iran by Nikanjam et al. (2016), which also observed significant differences in stress reactions based on degree, gender, age, and field of study. Understanding these patterns can inform targeted interventions to support students' well-being.

The limitations of this study include the absence of a comparison with domestic students, which could provide further insights into stress variations between these groups. Additionally, conducting research during the COVID-19 pandemic and the associated disruptions may have influenced stress levels differently than in normal circumstances. Despite these limitations, the study contributes significantly to the understanding of stress experiences among international students in Iran.

Implications

Adapting to stress involves three stages: alertness, resistance, and exhaustion. When an individual fail to adapt to stressors, their body's resources become depleted, eventually reaching the exhaustion stage. To support international students, the following strategies might be useful.

firstly, teaching stress management through workshops and meetings, developing interventions that respect cultural differences to help students manage stress and adapt to challenging factors and encourage knowledge sharing among higher-year students, who can offer valuable insights to their peers.

Secondly, proving social Support for students; social support plays a crucial role in coping with stress. It acts as a buffer, mitigating the impact of stressors

(Kristiana et al.,2022). Various forms of social support can reduce cultural stress experienced by international students (Franklin, 2013; Kristiana et al.,2022; Rai, et al.,2021). Perceived social support can provide solutions, reduce perceived problem importance, and encourage healthy behaviors (Tajvar et al., 2018).

Thirdly, university policies and interventions including strengthening social networks and foster connections among international students; providing information and consulting services for stress management; creating a friendly environment and promoting healthy interpersonal relationships between international students, their families, and friends.

Finally, addressing mental health needs. Limited information exists on how university experiences and environments impact international students' mental health. Research and resources are essential for professors and clinicians to understand and address these needs effectively.

CONCLUSION

In summary, the research emphasizes the importance of tailored support and dedicated resources to address the stress and overall well-being of international students. Understanding stress patterns and individual characteristics is crucial for promoting student well-being. By addressing stressors effectively, educational institutions can better support their diverse student populations. Universities should prioritize culturally sensitive services across student affairs and academic departments to support the well-being of international students. Culturally sensitive interventions, including stress management workshops, counseling services, and peer support networks, play a crucial role in enhancing coping strategies and creating a positive learning environment. By prioritizing student well-being and implementing evidence-based support programs, higher education institutions can empower international students to excel academically and flourish personally throughout their educational journey.

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