

Depression among the non-native international undergraduate students studying Dentistry in Bangladesh

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Abstract: Background: Bangladesh has been attracting international students on various subjects in recent times. Every year students from different parts of the world come to study undergraduate and postgraduate courses, mostly at private universities in Bangladesh. This study evaluates the depression status among international students who are studying dentistry in Bangladesh. **Methods:** This cross-sectional survey was conducted among International undergraduate dental students who enrolled in the Bachelor of Dental Surgery program in nine public and private dental colleges in Bangladesh. A total of 206 students completed the survey, and CES-D 10 items Likert scale questionnaire was used for data collection. The Cronbach alpha for CES-D 10 scale items for this population is 0.812. **Results:** The majority of the students (79.5%) are below 24 years of age, and students who cannot communicate well in Bengali (Bangla), about 60% of them have experienced depression. About 77.3% ($p < 0.00$) of the international students having financial difficulties exhibited depression. The international students who went through financial problems were two times more likely to suffer from depression ($OR=2.38$; p -value <0.01). **Conclusion:** This study tried to highlight the struggles faced by international students in Bangladesh studying dentistry. It is evident from the findings that several factors influence students' mental well-being during demanding dental education years.

Keywords: International student, Depression, Bangladesh, Dental, CES-D; Undergraduate

1. Introduction

International undergraduate students (IUSs) are defined as those students who have crossed borders for obtaining education in a non-native country, away from home, family, and beloved ones [1]. In recent times, Bangladesh has been attracting students from different parts of the world for various undergraduate programmes [2]. The inflow of IUSs is beneficial for both the host country and the students; IUSs benefit the host country by contributing 'intellectual capital,' whereas the IUSs receive education and a degree. Nonetheless, IUSs face innumerable challenges when moving to a completely unknown non-native country [3]. Beyond the difficulties related to the educational institution, adjusting to a new place may present socialization stress among the students [3,4]. They have to



deal with these problems without their family or familial support. The inability to cope with lectures and classroom activities and the most significant language barrier may result in anxiety or depression among the students [3].

Mental health is a growing concern for low and middle-income countries, and it is a tremendous public health concern worldwide. According to the World Health Organization (WHO), depression is defined as "a common mental disorder, characterized by sadness, loss of interest or pleasure, feelings of guilt or low self-worth, disturbed sleep or appetite and feelings of tiredness and poor concentration. It can be long-lasting or recurrent, substantially impairing a person's ability to function at work, school or cope with daily life" [3,5-7]. Mental conditions may reduce 12.3% of individuals' lifespan adjusted for disabilities and 31% of all years of life at all ages. The new updated WHO figures state that >300 million people are now dealing with depression and that between 2005 and 2015, that rose by 18 percent [8].

Obtaining an undergraduate academic degree in Dentistry requires tedious education and demands to acquire deep knowledge on the field. The course usually runs for five years, with the last two years of clinical training and one year of internship follows upon graduation. An undergraduate dental student must acquire theoretical knowledge and practical experience and develop interpersonal skills, which are judged at the end of each academic year through oral, written, and practical examinations. These persistent academic workloads and non-academic stressors, e.g., whole working day, coordinating with faculties, and administrative formalities, are generally stressful for students [6,9-11]. Given that, the extensive periods of self-study, minimal sleep, and hours of professional education may, in turn, contribute to social deprivation, psychological exhaustion, and depression. This burden may have a detrimental effect on their work and personal life. Early-stage identification of depression is vital to minimizing suicide deaths and intentional self-harm.

Besides the regular academic and non-academic workload that every student must follow, overseas students may face various other difficulties. For instance, language and cultural differences may cause a considerable barrier. They may also endure the financial crisis, unclear immigration status, homesickness, and alleged inequality above the usual university issues [12]. Students, especially those studying in foreign countries, who fail to adapt to changes and their new surroundings are more vulnerable to depression [5]. Several studies have shown that depression is extremely prevalent among international students [13-15]. Previous studies on IUSs have been conducted primarily in the developed countries. Several studies have recently emerged on the topic related to depression among students studying in government-funded public versus self-funded private universities [15,16]. It is also crucial to understand the extent of mental health's effect from studying dentistry abroad with different cultures, food habits, and adaptation among IUSs. However, no such study has been conducted among international undergraduate students studying dentistry and its effects on mental health. Hence for the first time, this study evaluates the depression status among international students studying dentistry in Bangladesh through a cross-sectional study design.

2. Methods

In this original study we have utilized a web-based cross-sectional survey design. This study's target group was IUSs who came to study Bachelor of Dental Surgery in public and private dental colleges in Bangladesh. The criteria were used to recruit the respondents - (i) international undergraduate dental students (IUDSs) (ii) enrolled in the Bachelor of Dental Surgery (BDS) program after completion, which leads towards graduation in Dentistry. There were no exclusion criteria used. Data were collected from October to December 2020 from the following selected dental colleges- Dhaka Dental College & Hospital, City Dental College, Mandy Dental College & Hospital, Pioneer Dental College & Hospital, Rangpur Dental College, Update Dental College & Hospital, University

Dental College & Hospital, MH Samorita Hospital and Medical College Dental Unit and Sapporo Dental College & Hospital. The researchers used their academic and professional network to find a gatekeeper from each of the dental colleges to send the Google form link. The researchers used snowballing sampling process and requested the IUDSs to circulate the Google form's weblink with other IUDSs in their respective colleges. A total of 206 students from the previously mentioned nine dental colleges submitted their responses. Among them, five students did not consent to participate in the survey, and one of them did not thoroughly fill out the questionnaire. Hence the final sample size of the survey was 200 IUDSs.

The survey questionnaire was adapted from another similar research conducted in Bangladesh [4]. The online questionnaire had three parts- background information, challenges faced, and depression measurement. The background information includes- age, gender, year of study, marital status, religion, living arrangements in Bangladesh, communication in Bengali (Bangla), and cooperation from the teacher or faculty member. The various challenges faced includes – problems adapting to local Bangladeshi food, homesickness, health problems, financial difficulty, living condition, and transport facility.

For assessment of depression, Centre for Epidemiological Studies Depression Scale (CES-D-10) 10 items Likert scale questionnaire was used [17]. The questionnaire contains three items on depressed affect, five somatic symptoms, and two on positive affect. Each item has the same numerical rating scale, and 0 represents "rarely", 1 means "some", 2 represents "occasionally" and 3 illustrates "most". The scoring was reversed for items 5 and 8, which are positive affect statements [18]. Total scores can range from 0 to 30 and the cut off scores for depressive symptoms were 10 or higher. The Cronbach alpha for CES-D 10 scale items for this population is 0.812.

The study was reviewed and approved (SDC/C-7/2020/764) by the Research Ethics Committee of Sapporo Dental College & Hospital, Dhaka, Bangladesh. Participation in this survey was voluntary and informed consent was sought before the study. The objectives of the research were clearly explained and assured that anonymity and confidentiality of the information. No incentives were offered to the participants. Data analysis was performed using IBM SPSS version 26 (SPSS Inc., Chicago, IL, USA).

3. Results

The students' ages ranged from 18 to 32 years, with a mean age of 23.22 ± 2.31 . The majority of the students (79.5%) are below 24 years of age as presented in Table 1. About 52.2% of female students shared that they were experiencing depression, and approximately 53.1% of students from other religious groups than Muslim have experienced depression. Third (3rd) year dental students (61.1%) have experienced depression comparing to the students from different academic year students. For students who cannot communicate well in Bengali (Bangla), about 60% of them have experienced depression. Of the students who have expressed problems regarding their studies, almost 63% of them revealed that they suffered from depression. Poor cooperation is also linked with students suffering from depression. Of the students who had poor academic interactions with their teachers, about 69.2% complained about suffering from depression. The students living with friends they did not suffer from depression compared to the student living alone (75%) and living with others (78.6%) have expressed their concerns with depression.

Table 1. Relationship between background characteristics and depression.

Variables.	Total n (%)	No depression n (%)	Depression n (%)
Total	200 (100)	97 (48.5)	103 (51.5)
Age group			
<i>Less than 24 years</i>	159 (79.5)	80 (50.3%)	79 (49.6%)
<i>More than 24 years</i>	41 (20.5)	17 (41.5%)	24 (58.5%)
Gender			

Female	157(78.5)	75 (47.8%)	82 (52.2%)
Male	43 (21.5)	22 (51.2%)	21 (48.8%)
Religion			
<i>Muslim</i>	70 (35)	36 (51.4%)	34 (48.6%)
<i>Others</i>	130 (65)	61 (46.9%)	69 (53.1%)
Marital Status			
<i>Married</i>	17 (8.5)	8 (47.1%)	9 (52.9%)
<i>Single</i>	183 (91.5)	89 (48.6%)	94 (51.4%)
Year of Study			
<i>1st year</i>	24 (12)	14 (58.3%)	10 (41.7%)
<i>2nd year</i>	26 (13)	14 (53.8%)	12 (46.2%)
<i>3rd year</i>	36 (18)	14 (38.9%)	22 (61.1%)
<i>4th year</i>	84 (42)	41 (48.8%)	43 (51.2%)
<i>Intern</i>	30 (15)	14 (46.7%)	16 (53.3%)
Living arrangement in Bangladesh			
<i>Living alone</i>	16 (8)	4 (25%)	12 (75%)
<i>Living with friends</i>	170 (85)	90 (52.9%)	80 (47.1%)
<i>Living with others</i>	14 (7)	3 (21.4%)	11 (78.6%)
Communication in Bengali (Bangla) language			
<i>Good</i>	135 (67.5)	71 (52.6%)	64 (47.4%)
<i>Not good</i>	65 (32.5)	26 (40%)	39 (60%)
Problem regarding studying			
<i>No</i>	81 (40.5)	53 (65.4%)	28 (34.6%)
<i>Yes</i>	119 (59.5)	44 (37%)	75 (63%)
Teacher and student's academic interaction			
<i>Fair</i>	126 (63)	61 (48.4%)	65 (51.6%)
<i>Full</i>	35 (17.5)	24 (68.6%)	11 (31.4%)
<i>Poor</i>	39 (19.5)	12 (30.8%)	27 (69.2%)

A vast majority of the International students (70.2%) had problems adapting to Bangladeshi food also experienced depression. About 80.5% of students suffered from depression due to homesickness. A vast majority of the students who had health problems (65.5%), financial difficulty (77.3%), and problems with the living condition (79.7%) of them complained about depression. Of the students who find it challenging to use the transport facility in Bangladesh about 65.5% of them suffered from depression. Homesickness, health problems, financial difficulty, and living conditions were significantly associated with depression as shown in Table 2.

Table 2. Challenges faced by IUDSs and associated with depression.

Challenges faced.	No depression	Depression	p-value
Local Bangladeshi food	34(29.8%)	80(70.2%)	0.11
Homesickness	17(19.5%)	70(80.5%)	0.00
Health problems	26(23.2%)	131(65.5%)	0.00
Financial difficulty	17(22.7%)	58(77.3%)	0.00
Living condition	12(20.3%)	47(79.7%)	0.00
Transport facility	41(34.5%)	78(65.5%)	0.98

The binary logistic regression analysis findings are shown in Table 3. The logistic regression analysis revealed that the homesick international student is two times more likely to experience depression (OR=2.55; p-value <0.00) than the students who did not feel homesick during their stay in the Bangladesh study. International students who experienced any health problems were three times more likely to suffer from depression (OR=3.58; p-value <0.00). The international students who went through financial difficulties were two times more likely to suffer from depression (OR=2.38; p-value <0.01) than those who did not encounter any financial problems.

Table 3. Binary logistic regression analysis between challenges faced by the IUDSs and its relationship with depression.

Challenges faced.	OR (95%CI)	p-value
Problem adapting local Bangladeshi food		
No	1	
Yes	1.07(0.55-2.12)	0.083
Accommodation Problems		
No	1	
Yes	1.((0.54-2.52)	0.69
Homesickness		
No	1	
Yes	2.55(1.30-4.99)	0.00
Health Problems		
No	1	
Yes	3.58(1.89-6.82)	0.00
Financial difficulty		
No	1	
Yes	2.38(1.20-4.70)	0.01
Faces transport problems		
No	1	
Yes	.107(0.54-2.08)	0.84

4. Discussion

Our study using the CES-D scale reveals that 51.2% of the international students suffer from depression studying dentistry in Bangladesh. The prevalence of depression increases with advancing years in education. In Bangladesh, undergraduate dentistry's new curriculum [19] consists of five years, with the first two and half years dedicated to knowledge-based education followed by practical and clinical teaching. After successful completion of the BDS course, they must complete a rotatory-based internship for one year. The increase in distress can be due to the transition from pre-clinical to clinical stages, as demonstrated in other studies [6,20]. Most studies reported that international female students studying medical or dental are more likely to suffer from anxiety and depression. The difference among female and male students varies from 53.9% to 30% and 46.1% to 16%, respectively [21,22]. However, in our study conducted, there wasn't any vast difference among the gender regarding depression among the students, with 52.2% female compared to 48.8% of male students.

In our study, 77.3% ($p<0.00$) of the international students having financial difficulties exhibited depression. This is consistent with several studies conducted on similar populations and found financial responsibilities or status to be significantly related to depressive moods [21,23,24]. Though it was also seen when students are financially secured with scholarships and funding, they tend to be less susceptible to depression than those

with none [15] as private universities or institutions are more expensive than public or government-funded ones [12]. The tuition fee for international students is more than that for national students; this helps generate additional revenue for the institution [1]. The raising tuition fee with the added expense of living puts the students under tremendous stress [13].

A significant change in a student's life is the transition from living with family to living away from their social network of family, friends, and neighbors in a non-native foreign country [3,25]. Adapting to a new environment and the absence of familiar surroundings tend to affect students' mood and stress levels [26]. As stated in a study by Babak Moeini and colleagues, 'depression is one of the homesickness components', reflected in our study [27]. Those who are homesick are 2.5 times more likely to be depressed. The state of accommodation plays an important role apart from homesickness on an international student's mental health. Not getting the desired place of living on time or the unavailability of a dormitory acts as stressors on the newly arrived students [3]. Our study found that those facing accommodation problems tend to be depressed more though it was not significant.

Stressors like the authoritarian style and poor feedback from faculties might cause great distress among students [3,28]. In Asian educational institutes, the relation between teacher and student is very formal, which may hinder better support and cooperation. A study conducted in a Greek dental school found that informal academic connection between student and teacher provides a positive environment [28]. Our research shows that students who received full intellectual interaction did not suffer from depression than those with poor academic interaction. In most studies, one of the most critical hurdles an international student studying healthcare is the inability to communicate [29]; the adaptation to the host country's language. This affects the social interaction with other students and generates a communication gap between institution & hostel (accommodation) administration who speaks only the host native language [3]. This language barrier affects a student's ability to understand class lectures and assignments, the confidence to participate and communicate in class, and may impact performance during oral examinations. A similar study conducted in China found that international students are not appropriately assigned due to patientcare, history taking, and conveying treatment plans for communication insufficiencies [30,31]. Even among international students studying in the USA, which is officially an English spoken country, Martirosyan and colleagues have reported differences in language proficiency and multilingualism concerning their academic experience and results [32].

As dentistry is a clinical and research-oriented subject, the post-graduate career development issues may also cause depression among the IUDSs graduating from dental colleges in Bangladesh. Whether the graduates will continue their further career in Bangladesh or return to their native countries, even the thoughts regarding complex academic and research career paths in a third country may seem like a puzzle to solve in a minimal amount of time after graduation. As a non-native dentist compared to their fellow native colleagues, the fresh international graduate dentists in Bangladesh may face challenges and feel difficult to learn clinical skills and gain trust among the local patients during their mandatory internship training periods. In an exciting study, Cohen and colleagues have explored the clinical preparedness range, communication ability, social comforts, and clinical confidence between USA-born and non-USA-born clinical radiation sciences students, and the findings were intriguing. Although the academic and research environment is more structured for international students in the USA than in Bangladesh and the widely used communication language between the students, clinicians, and patients in English, the student's place of birth was an influencing factor in each clinical preparedness domain [33].

We must consider that international students undertake different English proficiency exams before continuing their education in the USA. Even they felt less prepared clinically

than their native USA-born colleagues. In Bangladesh, an IUD must communicate both in Bengali and English to complete such a challenging clinical degree in dentistry. Furthermore, even if an IUD can learn Bengali, it takes time to get used to the typical local dialect, which varies according to localities and races. They can communicate in social and academic life, even with their patients, during clinical learning sessions. The patients may only explain the signs in their native and local Bengali dialect. A study revealed that foreign-trained dentists interested in seeking employment in the USA face numerous challenges, including complex admission processes, high tuition costs, immigration barriers, and cultural differences [16]. Similarly, in Bangladesh, an IUDS faces similar challenges and becomes worried, even may get depressed regarding their potential dentistry career. After graduation, they can be a massive asset to Bangladesh's local healthcare sector and contribute further as trained international clinicians and innovative researchers. As Bangladesh moves towards a developing country and its economic growth will attract more global investments, it will encourage foreign employees to immigrate for their professional career development. The international dentists trained in Bangladesh can support and serve the international community in the coming future. The government and health care authorities should make policies and guidelines for a smoother career path for the IUDSs who will graduate from dental colleges in Bangladesh. Increasing the diversity in the dental profession in Bangladesh to match the native population might improve dentistry access for the locals, international residents, and minorities, reducing dental care disparities.

5. Conclusion

This study tried to highlight the struggles faced by international students in Bangladesh studying dentistry. It is evident from the findings that several factors influence students' mental well-being during demanding dental education years. The educational institute must support housing, visa issues, and management of challenges faced due to cultural differences to the international students. Helping students to integrate into culture also requires attention from teachers and fellow students. Class lectures should be conducted in a medium that allows each student to understand the content. If necessary, the corresponding diplomatic representatives and their resident citizens in Bangladesh can cooperate to integrate the students into the community. They can also guide them to blend in with the culture. The dental college authorities also should arrange regular parents' meetings (on-site and virtual) and open dialogues between the students and their country representatives in Bangladesh. Also, routine psychological counseling, food and nutrition guidelines, and academically encouraging seminars should be arranged for the IUDSs. As dental education requires interaction with patients, special classes could be set for the IUDSs to learn basic language skills.

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and NS helped interpret the findings and edit the manuscript. SSJ, AKS, SKN, MSJ helped in the data collection process. All authors read and approved the final manuscript.

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