

Breaking the Silence - Uncovering the Root Causes of Depression among Undergrad Students in Bangladesh

Kazi Tanvir^{1*}, Zarif Amir Sanad², Muhammad Sazzadul Islam³,

Shaikh Allahma Galib⁴, Akinul Islam Jony⁵

^{1*,2,3,4,5}Department of Computer Science, American International University-Bangladesh (AIUB), Kuratoli, Dhaka, Bangladesh

^{1*}Department of Mathematics, School of Advanced Sciences, Vellore Institute of Technology, Vellore, Tamil Nadu, India

Abstract: Depression is a widespread and devastating mental health illness marked by persistent feelings of sadness and hopelessness, as well as a loss of interest or pleasure in previously valued activities. Millions of people worldwide are affected, affecting their emotional, cognitive, and physical well-being. After doing a background study we found that for undergrad students' social isolation, increased stress, fear of missing out, emotional burnout, family mistrust, school inefficiency, and graduation on time were the main causes of depression. Using the information from the background study we generated a model to uncover the causes of depression. In this paper, we tried to figure out what is the root causes that lead students to Depression. We collected data through an online survey system using Microsoft Forms. Later, the PLS-SEM algorithm was applied to the data collected data using SmartPLS software. Based on the hypothesis we constructed from previous literature, we have created a model. After testing statistical significance, we have finally come up with the final model.

Keywords: Depression, Pls-Sem, Higher Education, Psychological Factors, Mental Health Awareness.

1. Introduction

Major depressive disorder, also referred to as depression, is a significant medical condition that often impacts emotions, cognition, and actions. Nevertheless, it can be prevented. Feelings of sadness and a lack of interest in once-enjoyable activities are indicative of depression. This condition can hinder your performance both at work and home and lead to various mental and physical challenges [1]. The global COVID-19 pandemic has sparked widespread public health apprehensions. Many countries have enforced diverse measures, including stay-at-home orders and physical distancing mandates, in an effort to curb the transmission of the virus [2]. University students are prone to a heightened risk of encountering depression when compared to the general population. They often encounter additional stressors, such as adapting to changes in the learning environment, uncertainties regarding academic paths and living situations, and concerns about the job market's instability upon graduation [3]. Previous research found that university students reported the highest prevalence of depression symptoms compared to medical staff and the general population; 38.6% vs. 21.2% vs. 15.8%, respectively [4]. Negative consequences and comorbidity associated with depression symptoms include substance misuse, insomnia [5,6]. Considering the elevated occurrence of depression symptoms among university students, it is crucial to comprehend the risk and protective factors related to these symptoms and their potential association with depression after the pandemic. Such knowledge can help university administrators and mental health professionals develop targeted interventions to prevent the onset and progression of depression symptoms among students during the pandemic and pandemic recovery.

Variations in coping mechanisms may influence the link between isolation, stress, and depression, as research indicates that isolated individuals often utilize less adaptive coping strategies when compared to their non-isolated counterparts [7]. Moreover, the stress-buffer model posits that individuals have the potential to seek support from their social networks as a means of coping with stressful circumstances [8]. These approaches can aid individuals in perceiving these situations as less severe, subsequently decreasing the likelihood of developing symptoms of depression.

As previously stated, not everyone experiences harmful mental health impacts associated with social isolation, suggesting the existence of certain factors that might help alleviate the negative effects of being isolated. Resilience emerges as a promising candidate that could play a moderating role in mitigating these adverse consequences [9,10]. Resilience refers to the capacity to recover from adversity and adapt flexibly to evolving environmental challenges [6]. Research findings demonstrate that resilience serves as a positive predictor of psychological well-being, characterized by a constructive and enduring mental state that facilitates efficient functioning [8]. Concurrently, resilience exhibits a negative association with depressive symptoms [11]. When facing internal and external stressors, resilient individuals may adjust themselves with positive re-evaluation and problem-solving strategies, reducing the negative emotions associated with stressful situations and overall stress levels [11, 12]. For individuals experiencing isolation with restricted access to coping resources from external social networks, resilience can act as an intrinsic strength, facilitating their adaptation to challenging circumstances [13,14].

The present research aims to examine the associations among Fear of Missing Out (FOMO), Family Mistrust (FM), Social Isolation (SI), School Inefficiency (SIF), Graduation on Time (GT), Emotional Burnout (EB), and Depression in undergraduate students utilizing the Partial Least Square Structural Equation Modeling Method. Additionally, this study seeks to investigate the factors that influence FOMO, FM, SI, SIF, GT, EB, and determine their respective significance in the specified context.

2. Literature Review

2.1 Comparing PLS-SEM and CB-SEM: Advantages and Considerations for Researchers

PLS-SEM presents several notable benefits compared to CB-SEM in diverse research scenarios. Its adaptability, capacity to manage non-normal and categorical data, emphasis on prediction, iterative modeling approach, and ease of accessibility have led to an increasing recognition and utilization. Hair et al. (2019) provide valuable insights into the proper application and comprehensive reporting of PLS-SEM (Partial Least Squares Structural Equation Modeling) outcomes, making their research a valuable resource for researchers seeking a deeper understanding of this methodology [15]. It offers guidelines on sample size considerations, model assessment, mediation analysis, and bootstrapping techniques. The authors emphasize the importance of transparent reporting and recommend best practices for researchers employing PLS-SEM [15]. Munim and Noor's (2020) research investigates the relationship between young individuals' perceptions of service quality and the environmental performance of hybrid electric bus services using the Partial Least Squares Structural Equation Modeling (PLS-SEM) method [16]. Their study demonstrates the effectiveness of PLS-SEM in unraveling complex interconnections and uncovering latent constructs in the realm of travel behavior. By employing this advanced statistical technique, the researchers gain valuable insights into how young individuals' perceptions influence their choices regarding sustainable transportation options [16]. In their study, Dash, Ganesh, and Justin Paul (2021) conducted a thorough comparison between two prevalent structural equation modeling techniques, namely CB-SEM (Covariance-based SEM) and PLS-SEM, in the fields of social sciences and technology forecasting [17]. In their 2017 publication, Hair Jr. et al. present detailed recommendations for researchers on selecting either PLS-SEM or CB-SEM, conducting a comparative analysis encompassing model specification, sample size prerequisites, model assessment, mediation analysis, and latent variable interactions, facilitating informed decision-making for researchers in choosing the optimal method aligned with their research goals [18]. In his comprehensive work, Henseler (2017) offers a detailed exploration of PLS-SEM, encompassing its theoretical underpinnings, estimation techniques, model evaluation, and mediation analysis,

while emphasizing its merits such as accommodating intricate models with limited sample sizes and its orientation towards prediction-focused research [19].

2.2 PLS-SEM

The publication titled "A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)" [20] serves as an introductory handbook to PLS-SEM, offering researchers a complete grasp of its concepts, methodologies, and practical applications for their research endeavors. The book titled "Handbook of Partial Least Squares: Concepts, Methods, and Applications" [21] is an all-encompassing reference that delves into diverse facets of PLS-SEM, featuring inputs from prominent scholars in the discipline, thereby presenting sophisticated perspectives on the technique and its practical implementations. "Advanced Issues in Partial Least Squares Structural Equation Modeling" [22] is a supplementary reference dedicated to sophisticated subjects within PLS-SEM, encompassing intricate modeling concerns, sample size implications, mediation analysis, and other advanced methodologies, offering researchers an opportunity to augment their comprehension of PLS-SEM. In the article titled "Partial Least Squares Structural Equation Modeling: An Emerging Tool in Research" [23], the growing prominence of PLS-SEM as a statistical methodology is examined, emphasizing its benefits, practical applications, and offering valuable insights on its effective implementation in research studies.

2.3 Factors causing Depression

Przybylski et al. (2013) examine the psychological consequences of fear of missing out (FOMO) by investigating its motivational, emotional, and behavioral correlations, and its relationship with social media engagement and overall well-being [24]. Smith et al. (2008) present the Brief Resilience Scale (BRS) as a means of evaluating an individual's capacity to recover from adversity, measuring resilience as a psychological attribute, and has been applied in diverse settings to explore its association with overall well-being [25]. Schaufeli et al. (2002) undertake a cross-national investigation focusing on burnout and engagement among university students, exploring the variations in burnout and engagement rates across countries and investigating the contributing factors to these psychological conditions [26]. In their work, Schaufeli et al. (2002) introduce a two-sample confirmatory factor analysis method to quantify engagement and burnout, offering valuable findings on the factorial soundness of the Maslach Burnout Inventory (MBI) and its efficacy in evaluating both burnout and engagement [27]. Hu and Schaufeli (2009) conduct research on the factorial integrity of the Maslach Burnout Inventory-Student Survey (MBI-SS) in China, assessing its suitability in the Chinese cultural context and offering valuable insights into the instrument's psychometric attributes [28]. Uribe-Prado (2020) examines psychosocial risks, burnout, and psychosomatic factors among public servants, exploring their interrelationship and emphasizing the significance of managing psychosocial risks within organizational environments [29].

2.3.1 Covid-19 and Depression

Research conducted by Naser et al. (2021) [4] examines the psychological ramifications of the COVID-19 pandemic on diverse cohorts in Jordan. Utilizing online surveys, the authors assess levels of anxiety, depression, stress, and insomnia among the general population, healthcare professionals, and university students. The findings indicate a significant negative impact on mental health across all groups, with healthcare professionals and female students being particularly affected. The paper recommends coping strategies to address the psychological challenges and enhance the well-being of the affected groups, thus providing valuable insights for policymakers and mental health practitioners in managing the mental health implications of the pandemic [4].

2.3.2 Social Support, Positive Emotions and Depression

Cohen and Wills (1985) [8] examine how social support can moderate the effects of stress on psychological and physical well-being. The authors propose the buffering hypothesis, which suggests that social support protects individuals from the negative impact of stressful events by providing emotional, informational, or instrumental resources. The paper reviews empirical evidence for the buffering hypothesis from various domains, such as health, work, and family. The paper also discusses the methodological and conceptual issues involved in testing the buffering hypothesis and suggests directions for future research. In this study (Tugade & Fredrickson, 2004) [5], the authors explore the role of positive emotions in coping with stress and recovering from negative

emotional experiences, proposing a resilience model that involves generating, experiencing, and nurturing positive emotions amidst adversity, supported by evidence from experimental and longitudinal research, and discussing the implications of their findings for understanding the impact of positive emotions on health and well-being. Huppert (2000) contends that well-being encompasses both a subjective emotional state and an observable, malleable condition of the brain and body, while also exploring the complexities and possibilities associated with studying well-being through interdisciplinary approaches and supporting evidence [6].

2.3.3 Enhancing Resilience

In their comprehensive review, Southwick et al. [11] examined the extensive research on resilience, which pertains to an individual's capacity to navigate adversity and preserve mental well-being. The authors delve into the multifaceted aspects of resilience, encompassing biological, psychological, and social factors, and propose interventions that can enhance resilience. Moreover, their analysis suggests that resilience can serve as a protective factor against depression and improve outcomes in its treatment [11].

2.3.4 The Impact of Loneliness on Life Satisfaction

Padmanabhanunni and Pretorius [12] investigate the impact of loneliness on life satisfaction among young adults in South Africa during the COVID-19 pandemic, exploring the mediating roles of hopelessness, depression, and ego-resilience. Utilizing data from an online survey with 1,002 participants aged 18 to 35, the study reveals a negative association between loneliness and life satisfaction, partially mediated by hopelessness and depression [12]. Furthermore, ego-resilience emerges as a moderating factor, acting as a protective element against the detrimental effects of social isolation. The authors discuss the implications of these findings for mental health interventions and policy considerations [12].

3. Methods

In the below fig. 1 shows the experimental flowchart of our analysis. In our study examining the well-being of students enrolled in the BSc. in CSE program, we aimed to gather comprehensive data by conducting a survey targeting computer science engineering students aged between 18 and 26 years. By utilizing a survey approach, we have collected self-reported information on various factors that may impact students' well-being. Then we have preprocessed in order to apply the PLS-SEM algorithm and generated a conceptual model. And according to its finding we have further updated the model by only keeping the statistically significant variables. Hence the final model was developed. After that, opinions are analyzed and all the findings are gathered for discussion.

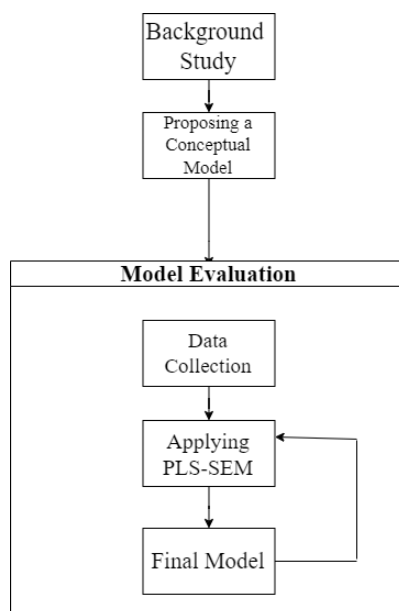


Figure 1 Methodology Flowchart

3.1 Key Elements

Several important factors influence social isolation, which leads to depression. Isolation increases depressive symptoms and self-doubt due to a lack of social support. Cognitive distortions may occur, distorting social cues and sustaining negative perceptions. Ruminating and overthinking deepen hopelessness [30]. Social isolation also interferes with stress management and coping skills, affecting physical health. Long-term isolation promotes chronic depression and impedes re-engagement. It can reduce a person's feeling of purpose and meaning, especially in vulnerable people who already have mental health concerns [31]. Recognizing these variables emphasizes the necessity of cultivating supportive relationships and getting assistance when necessary.

Chronic stress, emotional burnout, a lack of control and recognition, a work-life imbalance, isolation, cynicism, loss of interest, physical symptoms, and pre-existing mental health difficulties are all factors that contribute to emotional burnout, which can lead to depression [32]. Recognizing and treating these issues is critical for managing and preventing burnout and its possible effects on mental well-being.

Academic pressure, a lack of support, bullying, learning challenges, high expectations, apathy, extracurricular overload, peer and family demands, unhealthy coping, and academic underachievement all contribute to school inefficiency, which in turn leads to depression [33]. Addressing these characteristics is critical for creating a supportive school climate that promotes positive mental health and well-being in students, lowering the likelihood of depression.

Social comparison, loneliness, anxiety, sleep difficulties, excessive expectations, lower self-esteem, fear of rejection, escapism, and erroneous social media perceptions all contribute to melancholy caused by FOMO. Stress can be created and exacerbated by constantly seeking approval, comparing oneself to others, and fearing detachment [34]. To manage FOMO, you must have a balanced relationship with social media, cultivate offline interactions, set realistic expectations, and seek professional help if necessary. Addressing these issues can help diminish the impact of FOMO on mental health and lower the risk of depression.

A lack of emotional support, disagreements, abuse, inefficient communication, shattered trust, rejection, unresolved grief, parental mental health difficulties, overprotectiveness, and inconsistent support all contribute to family mistrust [35]. Such unfavorable family relationships might exacerbate depression symptoms by causing emotions of isolation, insecurity, and hopelessness. Addressing these issues requires open communication, obtaining professional assistance, setting limits, and cultivating a supportive family atmosphere [36]. Early intervention is critical to reducing the impact of family mistrust on mental health and the likelihood of depression formation or aggravation.

Academic pressure, financial strain, feelings of failure, peer comparison, family and social expectations, unmet aspirations, isolation, influence on mental health, loss of desire, and an unclear future all contribute to depression. Anxiety and depression can be exacerbated by the stress of extended academic deadlines and missed expectations. Financial constraints and social comparisons exacerbate emotions of inadequacy, while uncertainty about the future fuels worry [36]. To address these problems, supportive resources, academic counseling, stress management, and de-stigmatizing dialogues about graduation timeframes are required [37]. Promoting a caring attitude toward students' academic experiences can lower the risk of depression and increase general well-being.

3.2 Proposed Model

During the application of Partial Least Squares Structural Equation Modeling (PLS-SEM), the study established connections between various variables, with a specific focus on "Depression." Path coefficients were computed to gauge the magnitude and direction of these relationships, while p-values were acquired to evaluate the statistical significance of the estimated coefficients.

In the below Fig 2, shows the conceptual model:

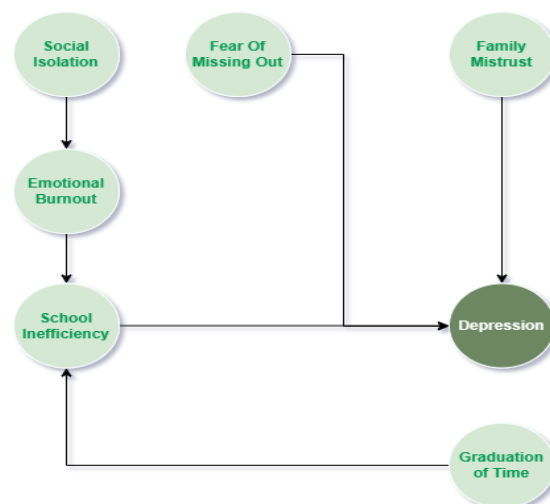


Figure 2 Conceptual Model (Proposed by Authors)

Based on extensive literature reviews, several significant connections were identified among the variables. Social Isolation (SI) was found to have a direct influence on Emotional Burnout (EB), which in turn impacted School Inefficiency (SIF). This chain of effects ultimately led to Depression. The literature suggests that individuals who experience social isolation may be more prone to emotional burnout, which can subsequently hinder their academic performance and contribute to the development of depression.

Another identified connection was between Graduation on Time (GT) and School Inefficiency (SIF). The literature suggests that school inefficiency, such as inadequate resources or administrative challenges, can impact students' ability to graduate on time. This relationship highlights the importance of addressing and improving educational systems to support timely graduation and potentially mitigate the risk of experiencing depressive symptoms.

Moreover, the study revealed a direct influence of Fear of Missing Out (FOMO) on Depression. The literature suggests that individuals who constantly fear missing out on social experiences may be more susceptible to feelings of sadness, loneliness, and ultimately, depression. This connection emphasizes the influence of FOMO on mental well-being, highlighting the need for strategies to manage and alleviate these fears.

Lastly, Family Mistrust (FM) was found to have a direct connection to Depression. The literature suggests that strained relationships, lack of trust, or unresolved conflicts within the family unit can contribute to feelings of emotional distress and increase the risk of developing depressive symptoms.

These connections, supported by the existing literature, provide valuable insights into the complex relationships between the variables. By understanding these connections, researchers and practitioners can develop targeted interventions and support systems to address social isolation, improve school efficiency, manage fear of missing out, and strengthen family relationships. These endeavors have the potential to advance depression prevention and treatment, fostering improved mental well-being and enhancing academic achievements.

3.3 Data Collection and Preprocessing

This study was carried out by conducting an online survey on Microsoft forms utilizing the purposive sampling method and a quantitative strategy. A non-probability sampling technique called "purposeful sampling" determines the sample's components based on the researcher's best judgment. Additionally, researchers are convinced that employing purposeful sampling techniques can result in significant time and cost savings [38]. For this study, the target population was undergraduate students of public and private universities of Bangladesh. Data from 100 students were collected by using Microsoft forms where there were 32 structured

questions and 6 demographic questions. The 15 structured questions included a 5-point Likert Scale where 1=Strongly Disagree, 2=Disagree, 3= Neutral, 4= Agree and 5= Strongly Agree.

The questionnaire was distributed among 200 undergraduate students of different public and private students of Bangladesh. 137 out of 200 participants responded to the survey in the time of three days. 17 individuals have been eliminated because of their unjust or unreliable answers. The average age of undergraduate students is around 24 years [39]. That is why 20 respondents were rolled out as they were above the age of 24. The response rate for this study was 68.5%, which complies with the requirement stated by W. Black & Babin, who stated that the minimum response rate for a survey should be 50% [40].

To assess the Fear of Missing Out (FOMO) phenomenon, we employed a 10-item Likert scale [41]. This scale will provide insights into the extent to which students experience worries, thoughts, and apprehensions related to social events, experiences, and conversations. This measurement allowed us to understand the influence of FOMO on the well-being of the students.

To gauge the perception of school inefficiency, a 6-item Likert scale was utilized. This scale, based on the six items adapted from Schaufeli and colleagues' work [26,28], which allowed students to express their agreement or disagreement with statements related to inefficacy in academic settings. By examining school inefficiency, insights into the challenges students face within their academic environment was gained.

Emotional burnout, a critical indicator of well-being, were assessed using a 5-item Likert scale where the five elements from Schaufeli and colleagues' adaptation of the emotional burnout concept was incorporated [26,28]. This measurement helped us understand the emotional exhaustion and depletion that students may experience.

To assess the impact of family mistrust on well-being, a 4-item Likert scale adapted from Uribe Prado's Modified Burnout Inventory (MBI) [29] and modified to evaluate family cynicism in the context of students' confinement and heightened interaction with their families was used.

Additionally, the likelihood of students graduating on time was explored by developing a 4-item Likert scale. With the guidance of a professional psychologist, students' perceptions of their ability to complete all academic requirements and earn their degree within the expected timeframe was assessed.

In data processing, the categorical data have been normalized into numeric data and the variables have been scaled to maintain a common range between them. Consequently, the calculation has been performed.

Table 1. Dataset overview

	Age	Division	Residence	University Type	Degree Program	Year
count	102.000000	102.000000	102.000000	102.000000	102.000000	102.000000
mean	3.186275	2.254902	1.931373	1.382353	4.196078	2.137255
std	2.480540	1.983528	1.196197	0.488362	4.061505	1.126101
min	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
25%	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
50%	2.000000	1.000000	1.000000	1.000000	2.000000	2.000000
75%	4.750000	3.000000	3.000000	2.000000	8.000000	3.000000
max	10.000000	8.000000	4.000000	2.000000	14.000000	4.000000

The descriptive statistics in table 1 provide an overview of the dataset, including the count, mean, standard deviation, minimum, quartiles (25%, 50%, 75%), and maximum values for each variable which consists of student's information. These statistics help to summarize the distribution and central tendency of the data for each variable in the dataset.

Table 2. Metadata (Factor, Question and Observatory variable name or Question tag)

Factor and Variable Name	Questions
Social Isolation (SI)	
SI1	I tend to bounce back quickly after hard times
SI2	It does not take me long to recover from a stressful event
SI3	I usually come through difficult times with little trouble
Fear Of Missing Out (FOMO)	
FOMO1	I fear others have more rewarding experiences than me.
FOMO2	I fear my friends have more rewarding experiences than me.
FOMO3	I get worried when I find out my friends are having fun without me.
FOMO4	I get anxious when I don't know what my friends are up to.
FOMO5	It is important that I understand my friends "in jokes"
FOMO6	Sometimes, I wonder if I spend too much time keeping up with what is going on.
FOMO7	It bothers me when I miss an opportunity to meet up with friends.
FOMO8	When I have a good time, it is important for me to share the details online (e.g., updating status).
FOMO9	When I miss out on a planned get-together it bothers me.
FOMO10	When I go on vacation, I continue to keep tabs on what my friends are doing.
Emotional Burnout (EB)	
EB1	I feel emotionally exhausted from my studies
EB2	I feel exhausted at the end of a day at university
EB3	I feel tired when I get up in the morning and have to face another day at the university
EB4	Studying or attending a class is really an effort for me.
EB5	I feel worn out by my studies
Family Mistrust (FM)	
FM1	In my family, everyone seems distant to me, which is why I am not interested in interacting with them.
FM2	I have a hard time not being rude to my family members
FM3	My family has a hard time understanding my school and personal problems
FM4	It is difficult for me to establish communication with my family members
School Inefficiency (SIF)	
SIF1	I feel that I cannot effectively solve the problems that arise in my studies.
SIF2	I feel that I do not contribute effectively to the classes I attend
SIF3	In my opinion, lately, I do not consider myself a good student
SIF4	Lately, I do not feel stimulated with the achievement of my study objectives
SIF5	Lately, I do not feel that I have learned interesting things throughout my studies
SIF6	During the classes, I do not feel confident that I am effective in achieving the objectives
Graduation on Time (GT)	
GT1	A prolonged session jam seriously obstructs the academic activities of a university
GT2	I am struggling with my coursework or failing classes
GT3	I feel like Personal, health, or family-related issues can lead to delays in graduating
GT4	I feel like difficulty paying for tuition or other expenses related to university can lead to delays in graduating

Table 2 provides a clear overview of the factors, their associated questions, and the corresponding variable names or question tags, which are necessary for gathering and organizing the information about these issues.

Later, these factors fulfill their roles as latent variables and serve as tracking variables for the factors that correspond to the question tag or name of the variable.

4. Results

4.1 Implementation of PLS-SEM algorithm

To determine the most influential factor contributing to depression of students, the research centered on examining both overall social anxieties and basic information of the students. The study aimed to identify the key elements that could potentially lead to depression among students while ensuring that there is no plagiarism involved in the research process. The PLS-SEM algorithm was employed utilizing the SmartPLS 3.2.8 software, which offers PLS-SEM algorithms for data analysis tasks. In this case, the PLS-SEM algorithm was applied. Figure 4 shows the algorithm's output, which showed the structure of the PLS-SEM inner and outer models. Table 1 provides a summary of the rules produced from the PLS-SEM.

Table 3. Bootstrapping configurations:

Subsamples	1000
Number of Results	Complete Bootstrapping
Test Type	One Tailed
Significance Level	0.05

To assess the statistical significance of various results in Partial Least Squares Structural Equation Modeling (PLS-SEM), bootstrapping is employed. Bootstrapping is a nonparametric technique used to estimate the sampling distribution of statistics by resampling the data. It enables the testing of path coefficients, Cronbach's alpha, HTMT (Heterotrait-Monotrait Ratio), and R² values, among other model characteristics. Complete bootstrapping provides comprehensive information and maximum details about the model's performance and validity.

4.2.1 Proposed Model Evolution

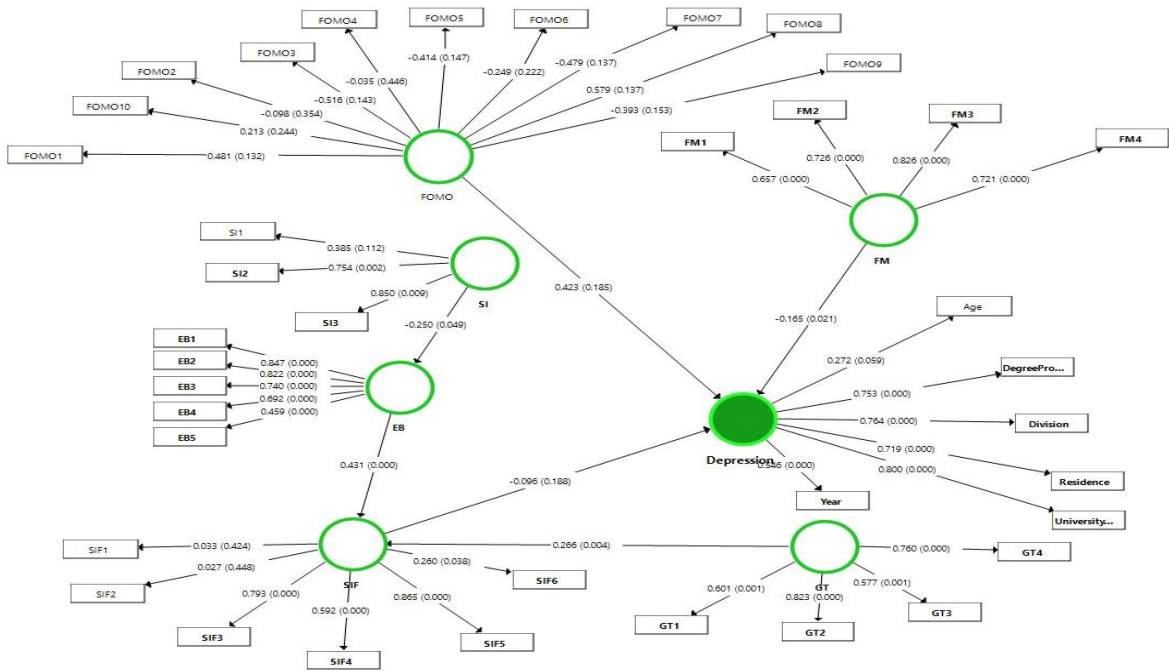


Figure3 Conceptual Model of inner and outer model from SmartPLS - Path Coefficient Value (P Value)

The following table (table 1) provides the Original Sample, Standard Deviation, and produced model from the previously mentioned model and T Statistics and Finally P value. In the figure 3 above, To determine the strength of the relationship between a factor and depression, the path coefficient is used, indicating its effectiveness as a potential cause of depression. Additionally, the p-value helps assess the statistical significance of the relationship within our model. Thus, To refine the model, non-significant variables were excluded, resulting in a final model for analysis.

Table 4. Mean, STDEV, T-Values, P-Values (Conceptual Model)

	<i>Original Sample (O)</i>	<i>Standard Deviation (STDEV)</i>	<i>T-Statistics (O/STDEV)</i>	<i>P Values</i>
EB -> SIF	0.431	0.088	4.876	0.000
FM -> Depression	-0.165	0.081	2.028	0.021
FOMO -> Depression	0.423	0.469	0.902	0.184
GT -> SIF	0.266	0.103	2.580	0.005
SI -> EB	-0.250	0.146	1.705	0.044
SIF -> Depression	-0.096	0.110	0.875	0.191

In summary, based on the analysis of the provided table, significant relationships were found between Emotional Burnout and School Inefficiency, Family Mistrust and Depression, Graduation on Time and School Inefficiency, and Social Isolation and Emotional Burnout. However, the relationships between Fear of Missing Out and Depression, as well as School Inefficiency and Depression, were not statistically significant.

4.2.1 Excluding latent and observing variables

In the analysis, the latent variable "Fear of Missing Out (FOMO)" was deliberately omitted from the analysis. Additionally, observing variables that are associated with FOMO were excluded, as well as selected observing variables linked to "Social Isolation (SI)" and "School Inefficiency (SIF)." Moreover, the variable "Age" was considered in relation to the target variable "Depression." To evaluate the statistical significance of the study, a p-value threshold of 0.05 was employed. This criterion is commonly used in research to determine whether the observed results are unlikely to have occurred by chance.

It offers valuable insights into the substantial connections between the latent variables and depression, revealing the factors that possess a statistically significant impact on the outcome. When considering these factors and experiences, it becomes feasible to pinpoint the specific elements that significantly contribute to the development of depression. The analysis provides a comprehensive understanding of the interconnections between variables and their respective impacts, ultimately influencing depression.

Excluded variables:

- **FOMO** [All observing variables]: Here, FOMO was excluded because all the observing variable connected to it was insignificant with a p-value of greater than 0.05. Thus, FOMO could not be enough significant to be in the final model.
- **SI** [SI1]: From Social Isolation, the variable SI1 was excluded.
- **SIF** [SIF1, SIF2]: SIF1 and SIF2, these two variables were excluded from the Latent variable School Inefficiency.
- **Depression** [Age]: Students' age was not impact much to determine depression as it was statistically insignificant.

4.3 Final Proposed Model

In the study, a conceptual model was initially constructed above, including several variables of interest. During the analysis process, certain variables were identified to be statistically insignificant and were consequently excluded from the final model. As a consequence of this exclusion, specific connections between the remaining

variables were also removed. The final model was built using the remaining variables. We used the PLS-SEM technique to examine how these factors relate to one another. During the course of this thesis, a comprehensive analysis was conducted, enabling us to gain valuable insights into the interrelationships among the remaining variables and their potential influence on the target variable, "Depression. In the Figure 4, shows the conceptual model:

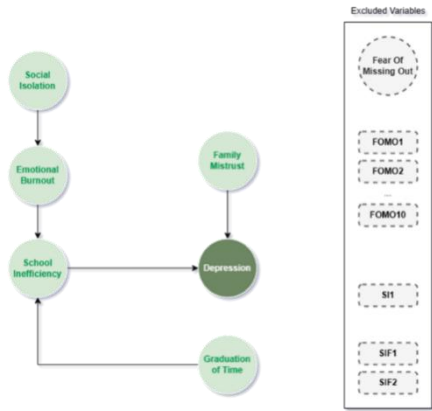


Figure4 Final Model after reducing insignificant variables

4.3.1 Final Model Evolution

Those significant connections in SmartPLS 3.2.8 were established, and the PLS-SEM algorithm with bootstrapping mode was applied to obtain maximum insight into the model. After the model was generated, the following visual representation (Figure 5) of the final model was obtained,

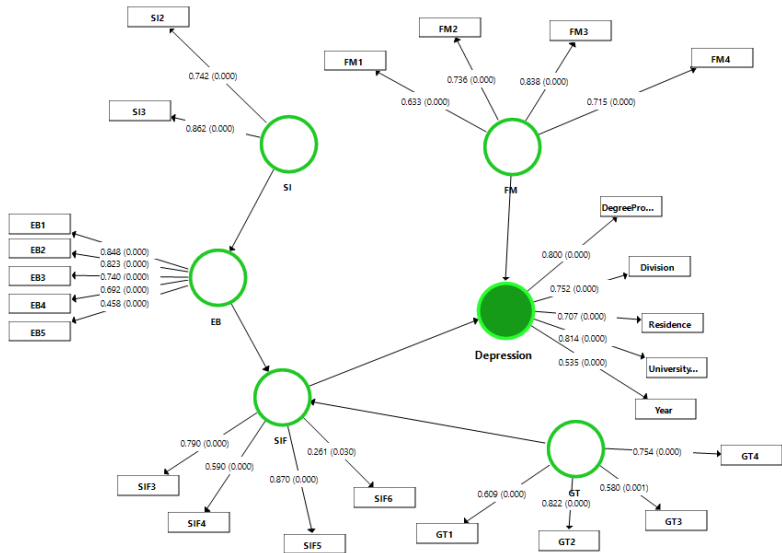


Fig. 5. Final Model of the inner and outer model from SmartPLS 3.2.8 - Coefficient (P Value)

Table 5. Original Sample, STDEV, T-Values, P-Values

	Original Sample (O)	Standard Deviation (STDEV)	T Statistics ((O/STDEV))	P Values
EB -> SIF	0.428	0.085	5.039	0.000
FM ->	-0.237	0.102	2.311	0.011

Depression				
GT -> SIF	0.268	0.083	3.246	0.001
SI -> EB	-0.254	0.096	2.658	0.004
SIF -> Depression	-0.153	0.089	1.710	0.045

Based on the analysis of the provided table 5, significant relationships were found between Emotional Burnout and School Inefficiency, Family Mistrust and Depression, Graduation on Time and School Inefficiency, Social Isolation and Emotional Burnout, and School Inefficiency and Depression. These findings suggest important connections between these variables and provide valuable insights into their influence on each other.

Table 6. Latent Variable Correlation Matrix

	Depression	EB	FM	GT	SI	SIF
Depression	1.000					
EB	-0.015	1.000				
FM	-0.252	0.101	1.000			
GT	0.024	0.226	0.092	1.000		
SI	-0.001	-0.254	-0.069	0.038	1.000	
SIF	-0.177	0.488	0.098	0.365	-0.008	1.000

Based on the analysis of the correlation matrix, various degrees of correlation between the variables can be observed, ranging from weak to moderate.

Table 7. Reliability and Validity

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Depression	0.774	0.801	0.847	0.531
EB	0.768	0.839	0.843	0.526
FM	0.723	0.795	0.822	0.539
GT	0.688	0.679	0.789	0.488
SI	0.461	0.483	0.784	0.647
SIF	0.564	0.714	0.741	0.449

These measures provide insights into the reliability and validity of the variables. Higher values for Cronbach's Alpha (≥ 0.7), rho_A (≥ 0.7), Composite Reliability (≥ 0.7), and AVE (≥ 0.5) generally indicate better reliability and validity, suggesting that the variables consistently measure the intended constructs and exhibit strong convergent validity.

Table 8. Discriminant Validity (Fornell-Larcker Criterion)

	Depression	EB	FM	GT	SI	SIF
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Depression	0.728					
EB	-0.015	0.725				
FM	-0.252	0.101	0.734			
GT	0.024	0.226	0.092	0.699		
SI	-0.001	-0.254	-0.069	0.038	0.804	
SIF	-0.177	0.488	0.098	0.365	-0.008	0.670

Based on the Fornell-Larcker criterion, discriminant validity is supported when the diagonal values (square root of AVE) are higher than the absolute values of the off-diagonal correlations. In this table, all diagonal values are higher than the absolute values of the corresponding off-diagonal correlations, indicating that discriminant validity is met for these variables.

Therefore, based on the Fornell-Larcker criterion, the variables in this table demonstrate satisfactory discriminant validity, indicating that they are measuring distinct constructs and are not highly correlated with each other. By examining factors such as social isolation, fear of missing out (FOMO), emotional burnout, family mistrust, and school inefficiency, we aimed to shed light on the complex interplay between these variables and their impact on the mental well-being of university students. Our final model highlighted the relationships between social anxieties, specifically emotional burnout, family mistrust, and school inefficiency, as significant factors contributing to the development of depression. The findings of this research provide valuable insights into the psychological challenges faced by university students in Bangladesh. By identifying the specific social anxieties that are strongly associated with depression, this study offers important implications for the design and implementation of targeted interventions and support systems to address mental health issues among university students.

Discussion

Individuals and society as a whole can be affected by social concerns in a variety of ways. These anxieties, defined by anxiety and discomfort in social circumstances, can have a substantial impact on a person's mental and physical well-being, interpersonal connections, and overall quality of life. One of the most significant effects of social anxiety is the impediment to personal growth and development. People who suffer from social anxiety may avoid social engagements or events that provoke their phobias, such as public speaking, attending parties, or even casual discussions. This avoidance might result in missed opportunities for learning, networking, and growth in one's job. It can also make it difficult to form meaningful relationships and establish a strong support system, both of which are necessary for personal and emotional growth. Isolation and loneliness can be exacerbated by social anxiety. Individuals who are constantly examined or scrutinized by others may withdraw from social activities and isolate themselves. Because individuals lack opportunities to examine their negative attitudes and beliefs about social interactions, their solitude might increase their anxiety. A lack of social connection and support can lead to sadness, low self-esteem, and a weakened sense of belonging over time. Social anxiety can have an effect on academic or professional performance. Fear of being evaluated and criticized may prevent students from engaging in class discussions, expressing their opinions, or requesting assistance when needed. Social anxiety in the workplace can appear as trouble speaking up in meetings, networking, or establishing oneself in professional contexts. These difficulties might stymie job advancement and limit prospects for professional development. Additionally, social fears might have a societal influence. When a large proportion of the population suffers from social anxiety, it can lead to lower community participation, weakening social cohesion, and diminished collective problem-solving ability. It may also contribute to a fear-based culture, promoting stigma and misinformation about mental health. Individuals and society are both affected by social anxiety. They can stifle personal development, lead to isolation and loneliness, have an impact on academic and professional performance, and contribute to societal difficulties. Recognizing and treating social concerns through supportive interventions, counselling, and de-stigmatization

activities can assist individuals in overcoming these obstacles and living fulfilled lives. Social anxiety is a common mental health issue among Bangladeshi university students. However, by identifying the signs and symptoms of social anxiety, focused interventions and support systems tailored to the specific requirements of Bangladeshi students can be devised. This can involve offering education, counseling, social support, and financial assistance to students in order to help them acquire coping methods and develop abilities to control their symptoms. Students can feel more comfortable seeking aid and support if stigma and awareness of the condition are reduced. Finally, by addressing the signs and symptoms of social anxiety, we can help students in Bangladesh create a friendly and inclusive environment.

Comprehensive mental health support services inside university settings are critical to addressing students' growing mental health concerns. On-campus mental health services range from group workshops to individual therapy, and many colleges also provide in-person or online programs that are usually free or extremely affordable. The stigma associated with receiving mental health care can be minimized by making mental health support services a common part of university life, and students can feel more comfortable requesting help and support when they need it. Comprehensive mental health support services can assist students improve their academic achievement by treating mental health issues that may be interfering with their capacity to learn. Furthermore, comprehensive school mental health services are critical to creating and maintaining safe schools, and increased access to mental health services in schools is critical to improving students' and schools' physical and psychological safety, as well as academic performance and problem-solving skills. It is necessary to provide a continuum of school mental and behavioral health services in order to successfully address the range of students' needs. Counseling, group therapy, and peer counseling are all examples of comprehensive mental health support services. Campus advocacy groups are also student-run organizations that exist to help students. By incorporating comprehensive, culturally sensitive school mental health services into the fabric of the school system, we may assist address inequities in access and eliminate the stigma associated with receiving mental health treatment. A holistic, all-encompassing strategy would also include mental health awareness training for school employees as well as ready access to in-school mental health supports and services for all kids. To address the growing mental health difficulties that students confront, comprehensive mental health support services inside university settings are required. Students can receive the attention and support they need to excel in their academic and personal life through increasing access to mental health care, eliminating stigma, enhancing academic achievement, and providing crisis management and holistic support. It is critical to make mental health care routine and convenient for students, as well as to provide a continuum of mental health services that accommodate students' different needs.

Social anxiety is a complex mental health issue that can be influenced by a variety of variables. Because of the interaction of these elements, several social concerns can become the cause of another. Stress, poor academic performance, isolation and loneliness, coping techniques, and the college transition can all contribute to the development of social anxiety. Multiple social concerns, such as financial hardship, academic pressure, and social isolation, for example, can raise stress levels in students, leading to the development of other anxieties such as generalized anxiety disorder or panic disorder. Social worries can also have a poor impact on academic performance, which can lead to even more anxiety and stress, creating a difficult-to-break cycle of anxiety and underachievement. Coping techniques can play a role in the development of social anxiety, and if pupils do not have good coping strategies for dealing with stress and worry, they may acquire social anxiety as a coping mechanism. Transitioning to college may be a stressful period for students, and this stress can lead to the development of social anxiety, particularly for students who are leaving home for the first time or attending college in a new city or country. To prevent the development of social anxiety and other mental health issues in students, it is critical to recognize and address these risk factors. Offering comprehensive mental health support services in university settings can assist students in developing effective coping skills and managing mental health difficulties. We can help students overcome social anxiety and thrive in their academic and personal life by addressing the intricate interaction of numerous factors that affect mental health.

Depression is a prevalent mental health issue among Bangladeshi university students, and it can be avoided by addressing the other connected social issues. Reduced stress improved academic performance, reduced isolation

and loneliness, and the development of good coping techniques can all help to prevent depression. Financial hardship, academic pressure, and social isolation, for example, can all increase stress levels in students, leading to depression. Financial assistance, including learning resources, as well as the development of strong social support networks, can help lessen financial obligations and reduce anxiety. Addressing social fears that have a negative impact on academic achievement, such as academic pressure and poor sleep quality, can also aid in the prevention of depression. Academic support programs, such as tutoring and study groups, can assist students in coping with academic stress and improving their performance. Addressing social fears that cause feelings of isolation and loneliness can also aid in the prevention of depression. Clubs and organizations that provide chances for social engagement can help students create social connections and lessen feelings of isolation. Developing appropriate coping mechanisms for stress and anxiety can also aid in the prevention of depression. Counseling services and the training of coping skills such as mindfulness and relaxation techniques can assist students in managing their mental health issues. We can help students avoid depression and thrive in their academic and personal life by addressing the intricate interaction of numerous factors that affect mental health. Offering comprehensive mental health support services in university settings can assist students in developing effective coping skills and managing mental health difficulties.

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