

## An Empirical Review on Study Anxiety and Exploring its Prevalence in University Students of Pakistan

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### Original Article

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### Abstract

*University students are a distinct subset of community, characterized by specific characteristics and emotional reactions. This research includes a comprehensive survey conducted to examine study anxiety in general, as well as an empirical review addressing study anxiety in Pakistani university students. The survey findings revealed that study anxiety can be categorized into two types: social/functional anxiety and test anxiety. Test anxiety is a temporary condition that arises during examinations and dissipates afterward. However, social or functional anxiety is an ongoing concern that can escalate to a phobic level and even to trauma. Utilizing a standard self-assessment scale, this study examined university students in Pakistan and discovered that approximately 80% of students' experience social or school anxiety. This alarming statistics clearly demonstrates the significant prevalence of social anxiety among university students in Pakistan. Consequently, there is an urgent need to address this issue effectively.*

**Keywords:** Study Anxiety, University students, Phobia, Pakistan, Statistics, Machine Learning, Post Trauma Stress Disorder (PTSD)

### Introduction

Anxiety is a feeling of being uncomfortable because of an unknown danger that may or may not come upon. Anxiety is a latent variable with many facets; prominently fear, depression and stress. Though, these terms are used interchangeably but, there are subtle differences amongst them all. Generally, in fear, the danger is known. Therefore, fear can be perceived in positive sense because this helps to prepare for the known danger to come upon in future and may ultimately even help to prevent it. However, in anxiety the fear is of unknown and an individual's control over anxiety is the measure of his/ her avoidance to the states that causes unknown fears. Anxiety is an emotional response to threats caused by stress and is related with the fight or flight responses of our Central Nervous System (CNS). The term anxiety disorder is used in the sense of depression and deterioration of one's physical health because of severe mental ailment caused by stress of unknown fears. It is the situation when an

individual cannot manage his/ her state of fear. Anxiety becomes a disorder when it becomes excessive, uncontrollable to an extent that it starts intervening in daily life routines. This irrational becoming of anxiety which is generally termed as anxiety disorder is categorized as varying mental health states which include for instance generalized anxiety disorder (GAD), social phobias, agoraphobia and panic disorders.

Different regions of human brain activate and chatter amongst them in different emotional states. If for some reasons (risks) these regions start functioning inappropriately then anxiety starts becoming a problem which can later turn to be a disorder, indicated by change in human behavior. The regions of brain that activate and function in synchronization to confront anxiety and avert it from becoming a disorder forms a fear network. According to researchers, human brain can be divided in to two main regions; cognitive and emotional. Cognitive brain is the frontal lobe. It is the area where the feelings, logic and thoughts unite together as one unified sensation. Anxiety becomes a disorder when the emotional brain overpowers the cognitive brain and hence the fear network starts deteriorating (Gadye, 2018).

Performance of an individual is a function of stress and both are directly related to each other up till a cutoff or threshold value. Further increase in stress causes the breakdown. At this point in performance, mental health and anxiety disorder starts developing and progresses with deterioration of mental health. This is the point of concern to researchers. Stressors at this point are critical and impactful. This relationship amongst performance and stress is shown in Figure 1 as depicted from (Wu, 2017).

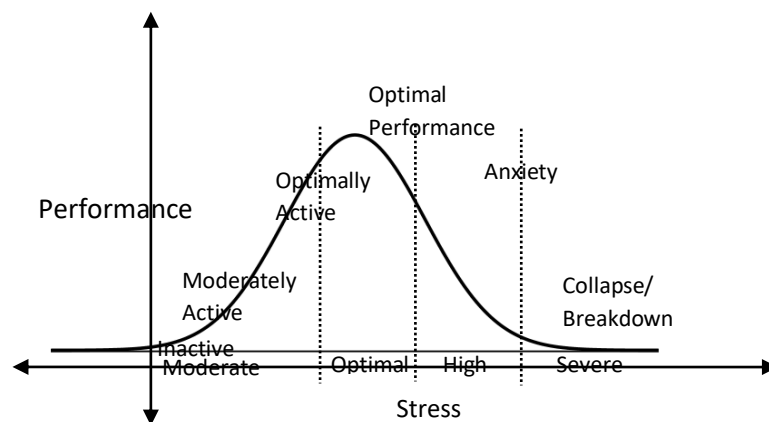


Figure 1: Performance vs. Stress Graph

Anxiety can be observed in many different practical life problems; teaching, learning and education is one of them. To the route of reaching a professional learning community, detailed and in depth curriculums with variations in the topics have gained significant importance in the education system worldwide. However, performance and understanding of subjects among university students is still a matter of concern and anxiety is one of the biggest hurdles to reach that heights by students.

In a regular classroom interaction with the students, a very common factor observed in their way of learning is anxiety (Khuda, 2020). This anxiety could be because of any reason, for example fear of being bullied by friends on trivial questioning or improper answering, fear of parents' scolding, mocking or making fun, or it may be of not being able to grasp the topic

properly and difficulty to learn or memorize it; in any case it seeds an unknown fear factor among the students towards the course of study. The result is that learning is no more a fun for these students but rather a burden or could even be a nightmare. This further develops into a very serious situation called study anxiety. Hence, not all students' snags result from cognitive problems. Students also have study anxiety that harshly upsets their education learning. In this situation, course of study renders no usefulness to the students. Study anxiety is not just limited to examinations or lecture hall settings but study anxiety effected people fails professionally as well as. They are most likely not able to choose careers involving the real and/ or lucrative opportunities of their degree programs.

In general anxiety among the university students is study anxiety. This means any anxiety that is coming in the way of their studies. This can be broadly categorized as being social anxiety or test anxiety, as confirmed by many researchers who have worked on students' anxiety problems (Farokhi, 2017).

Social anxiety disorder is taken as a condition of fear of insult or bullied when meeting and socializing with others. This may lead to stumpy self-worth, loss of identity and lower self-esteem. Social anxiety and its disorder is a serious problem that takes away all the sugar from life (Jung, 2018).

Different survey methods as measurement scales are available for the measurement and assessment of social anxiety disorder (SAD). Two of the recently produced scales include Fear of Negative Evaluation (FNE) Scale and Social Avoidance and Distress Scale (Watson, 1969). Both of these scales were in True/ False format and so the level of measured variable i.e. fear was not quantified. Other scales include Social Phobia Scale (SPS) and Social Interaction Anxiety Scale (SIAS) (Mattick, 1998). Former assesses performance anxiety and the latter measures interaction anxiety. Furthermore, there is Interaction Anxiousness Scale (IAS) (Leary, 1983) and Social Phobia Inventory (SPIN). The Liebowitz Social Anxiety Scale (LSAS) (Liebowitz, 1987) (24 items) is a widely used SAD research tool with recognized acceptable psychometric properties. Recently authors in (Ejaz, 2020) developed SAD assessment and measurement scale in Urdu language; designed especially for Pakistani higher education institutions. According to the authors this scale's uniqueness is to ensure cultural integrity of Pakistan. The Liebowitz Social Anxiety Scale (LSAS) (24 items) is one of the most used SAD rating instruments possessing satisfactory psychometric properties for research and clinical purposes.

### Literature Review

In (AlKandari, 2020) factors were identified that caused anxiety among university students. These included "studying a new language, the curriculum difficulty, exertion in exams, financial pressure, cultural shock, family responsibilities, illness, employment, discrimination and disabilities". Authors also recommended that due importance must be given in benefitting students with an encouraging learning environment that can keep them stay mentally healthy and happy in the university. This will protect them from an unwelcoming anxiety emotion that will avert building negativity among the students towards their studies.

A similar research was steered to identify anxiety levels and its predictors in the undergraduate students of Bangladesh alongside the limitations met by them through e-learning (Hoque, 2021). To achieve this, an online cross-sectional study survey with a sample of 206 undergraduate students was piloted by means of a well-structured questionnaire. Their anxiety

level was assessed by means of Zung's self-rating anxiety scale (SAS) and predictors were recognized by using a Tobit model. Problem Confrontation Index (PCI) was utilized to rank the constraints. It was found that about 82.5% of the undergraduate students in Bangladesh are experiencing slight to risky anxiety, while 14.08% are suffering from high end anxiety.

(Adams, 2021) unveiled that a changeover into university life can be an important leading factor to cause mental disorders. Furthermore, authors coined the terminology "internalizing disorders" for anxiety. According to them it is because anxiety has causality and its direction is inward. This idea is very similar the idea of *identity loss*. This is associated with melancholy and lonesomeness. The research was conducted using a survey method executed on first year students in a public university in Kingston, Ontario, Canada in 2018.

A study was conducted with the objectives to explore the frequency of depression, anxiety and stress amongst university students in Sialkot, Pakistan (Asif, 2020). Data was collected using a survey research method from three universities of Sialkot by using simple random sampling technique. Sample size comprised of 500 university students. Depression, anxiety and stress scale DASS-21 was used to measure their levels respectively. It was found that the frequency of depression, anxiety and stress among university students was found to be 75%, 88.4% and 84.4% respectively. Results were generalized study anxiety with no investigating to classify it as social anxiety or test anxiety.

Using a systematic review and meta-analysis, researchers attempted to determine the occurrence of depression symptoms in Pakistani university students (Khan, 2021). Researchers used databases from "PubMed, Web of Science, PsycInfo and Google Scholar". Cross-sectional and longitudinal studies, available till 31st December 2019 were included. Data on study physiognomies and occurrence of depressive symptoms were mined. Meta-analysis was performed with random effects models. Sub group differences were estimated using meta-regression and sub-group analyses. Overall 26 studies were systematically reviewed involving 7,652 participants. Occurrence of depression signs was 42.66% (95% CI: 34.82% to 50.89%), with significant heterogeneity in between the studies.

Another survey was conducted for quantitatively finding the mathematics anxiety among the graduating Pakistani students (Khuda, 2020). A sample of 360 students from Electronic Engineering, Business and Media Sciences were taken and data was evaluated using principal component analysis and regression statistics. The research instrument was a questionnaire that was specifically developed for this purpose. Results revealed that two factors are predominantly contributing towards mathematics anxiety in Pakistan; (1) inability of students to correlate mathematics with practical life and (2) the student's emotional instability towards the subject. These factors successfully explained the total proportion of 54.24% of anxiety for mathematics in the sample. Especially computational thinking topics need special care while teaching because they cause more anxiety among the students (Khuda, 2022).

In contrast to survey questionnaires, measuring anxiety behavior via aversive stimuli or anticipatory responses to threats can also be used to assess anxiety in a subject. Most research so far has focused on acquiring from observation of direct reactions. Researchers have explored on how observational fear is influenced by characteristically anxious preventive responses (Selbing, 2019). High anxiety persons frequently show characteristically anxious anticipatory behavior; discriminating between innocuous and perilous stimuli. Researcher have

utilized a "mood induction task" technique to determine anxiety among the subjects as in (McGinnis, 2019).

Muscle contractions measurements are mainly measured using electrical signals through electromyography (EMG) (Stegeman, 2007). However, muscle contractions can also be measured by monitoring the mechanical vibrations that occur after muscle movements through mechanomyogram (MMG) (Esposito, 2018). Both electrical and mechanical signals can be used to measure anxiety because of muscle contractions. In addition, measuring heart rates (HR) and pulse rates (PR) also give significant results for identifying and measuring anxiety. However, reading and interpreting ECG and EEG signals is still considered to be a complicated method.

In a related research, a psychophysiological record, encompassing 213 (92 depressed patients and 121 normal controls) subjects, was built (Cai, 2018). The electroencephalogram (EEG) signals of every participant in latent and non-latent using a sound stimulation were composed using a prefrontal-lobe three electrode EEG system. Using signal processing and machine learning techniques researchers were able to distinguish the depressed participants from normal controls. The classifiers' performances were assessed using 10-fold cross-validation.

### Discussion on Literature Review

The literature study has highlighted a confounded status on the understanding of prevalence of study anxiety in university students of Pakistan. There exists obliviousness that study anxiety can be classified to test anxiety and social anxiety. Also, terms like anxiety, stress, depression and fear are used quite interchangeably. However, to provide an engineered solution for predicting or classifying anxiety there must be distinguishing features and well defined causality i.e. the cause and effect must be present.

The literature review has enacted two research problems which can be investigated and worked upon. Firstly, is the unavailability of the investigations of social anxiety among the university students of Pakistan. Secondly absence of a well-defined prediction model for social anxiety in university students with stress trigger as the input. If both are combined, then the problem definition that has budded from our literature study comprises of absence of a prediction model for social anxiety among Pakistani university students. In addition to this, significant stressors as factors need to be identified that are contributing towards social anxiety among Pakistani university students.

With the focus on university students' anxiety, our literature study has shown that basically there are two types of study anxiety in university students, namely 1) social anxiety and 2) test anxiety. The former can be reflected as a state starting from fear and gradually progressing to phobic or even to trauma. On the other hand, test anxiety is temporary and is either present or absent. Therefore, social anxiety is more dangerous and needs more attention. The second important finding from our literature survey is that social anxiety problem is a less explored area of research in Pakistani higher education institutions.

Machine learning is a very effective AI tool to measure predictions which are not easily conceivable (Hussain, 2019). It has been very dominantly being used to predict anxiety as a classification problem by many researchers. Commonly used algorithms which have been used include random forests (RFT), support vector machines (SVM), catboost, naive Bayes, logistic

regression and convolution neural networks (CNN) for text mining from blogs and posts on different forums of seafarers (Sau, 2019). Machine learning algorithms heavily depend on data analysis to identify patterns among the variables for making appropriate predictions. In this regards biofeedback is also a competitive contender to identify anxiety patterns among the subjects. Signals obtained from bio sensors are not wavy and can be trusted upon. So there seems to be an obvious gap between these two ways of data collection (Ma, 2023) and (Ahmed, 2023).

### Experimental Justification on Prevalence of Social Anxiety as Study Anxiety

As discussed above, study anxiety very much encapsulates social anxiety of students. But for this region, Pakistan, our survey shows no such data available to justify this. We conducted a survey to explore the prevalence of social anxiety in Pakistan using social anxiety (Liebowitz, 1987).

For this purpose a total of 226 students were randomly selected to take part in the survey. Participants were selected which fulfilled the following criteria.

- a) They were undergraduate students from Engineering/ Computer Science, Business, Medicine/ Health Sciences and Fashion Designing courses of studies.
- b) They included both male and female gender students.
- c) They were students who were in the age group of 15 to 30.

Data was collected online in the context of social anxiety of university students. Students filled the form on their own consent. In order to interpret the data descriptive analytics were utilized.

### Findings of the Study

Frequency distribution of students from different domains of studies who participated in the survey are shown as bar graph in Figure 2.

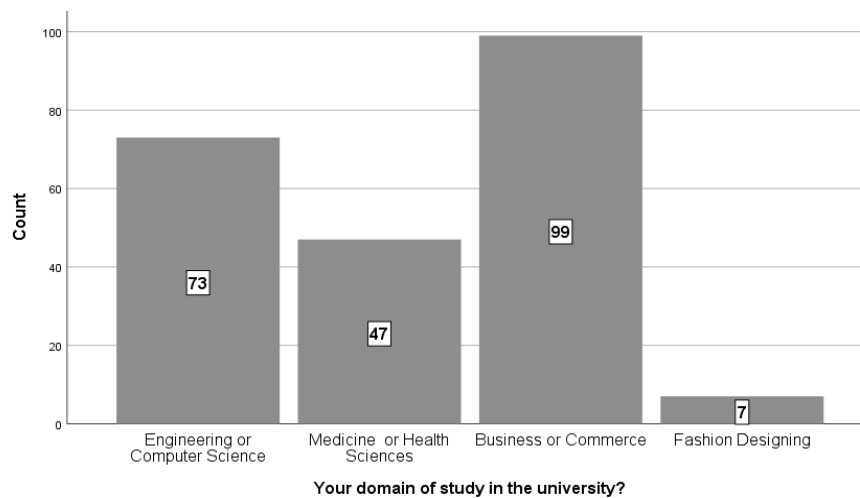


Figure 2: Frequency distribution of students from different domains of studies

Frequency distribution of male and female students in the survey are shown in Figure 3.

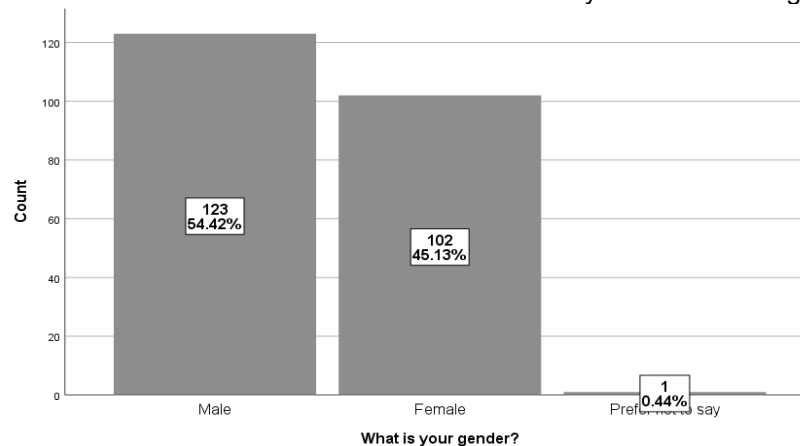


Figure 3: Frequency distribution of students from different genders

Frequency distribution satisfying the age criteria is shown in Figure 4.

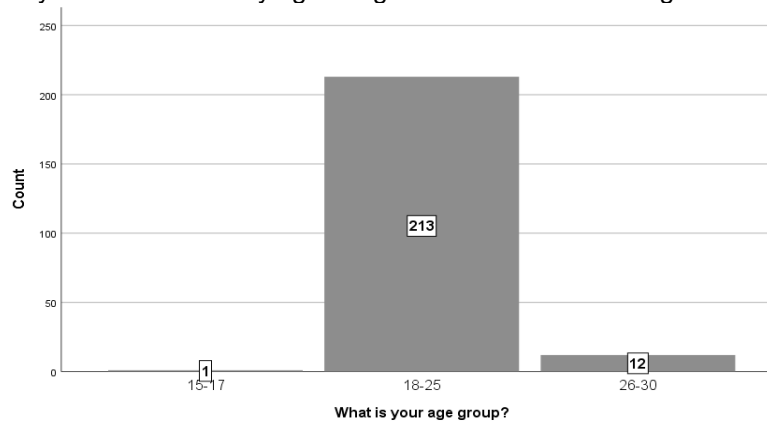


Figure 3: Frequency distribution of students from varying age groups

Table 1 displays percentage of social anxiety prevalent among the students who participated in the survey study. These statistics are clear evidence of the presence of school anxiety in Pakistan. Different levels of school anxiety cumulate to a total of 79.5% prevalence. This is quite a critical value as compared to remaining 20.5% of no presence of school anxiety.

<i><b>Anxiety Levels</b></i>	<i><b>Frequency</b></i>	<i><b>Percent</b></i>
<i>Very severe school anxiety</i>	14	6.2
<i>Severe school anxiety</i>	20	8.8
<i>Marked school anxiety</i>	36	15.9
<i>Moderate school anxiety</i>	50	22.1
<i>Mild school anxiety</i>	60	26.5
<i>No school study anxiety</i>	46	20.4
<i>Total</i>	226	100

Table 1. Results from the conducted empirical survey

Descriptive analytics of Table 2 not only show presence of social anxiety among university students but also its presence with a varying classification. Social anxiety distribution (mean value) among students from different domains of studies and gender are shown in Table 2.

<b>Gender</b>	<b>Domains of Studies</b>	<b>Anxiety (Mean Value)</b>
Male	Engineering or Computer Science	44.20
	Medicine or Health Sciences	58.45
	Business or Commerce	53.48
	Fashion Designing	52.50
Female	Engineering or Computer Science	46.37
	Medicine or Health Sciences	48.31
	Business or Commerce	61.88
	Fashion Designing	80.40

Table 2. Results from the conducted empirical survey w.r.t gender and domain

A few recommendations that can be used to overcome the school/ social anxiety among students include that teachers can utilize the idea of using alternative techniques for teaching specifically for tough parts of the course. There are topics in which students get stuck because of the requirement of strong mathematical skills and that can cause study anxiety among them (Khuda, 2019) created a customizable MATLAB GUI for learning of convolution integrals. This GUI proved effective not only in teaching but also in the learning of students for this topic along with its practical applications. Similarly, (Khuda, 2021) innovated the teaching pedagogy for teaching and learning of complex topic of Bayes inference with alternative methods.

### Conclusion

In this review, we have investigated the justification of prevalence of study anxiety in terms of school anxiety among university students of Pakistan from the published research available in the literature. To justify we also conducted an empirical survey. Our survey review showed that most of work done in this domain is on test anxiety. The aspect of social anxiety or school anxiety still needs more investigation in term of its assessment for the target demography. We have also surveyed on the techniques used for anxiety assessments, their discrepancies and provided our considerations on obtaining prediction models which are cost effective in terms of their cost functions. Our empirical review showed that around 80% school anxiety exists in here. This is in high contrast to justify the prevalence of school anxiety here and need to scientifically work on its aversion. It is concluded in the research that cognizance, acknowledgement, and appropriate controlling may lessen stress among the students and develop their recital positively and so also their goodness of living. This study has the limitations that the domain of research study needs to be widened and sampling size to be increased. We plan to carry out this research on a larger scale in the future to explore and mine more about social anxiety among students of Pakistan in comparison with other developing countries.

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