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# Construction and Validation of "Abisus Scale": A Tool for Assessing Examination Fear Among University Students

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**Abstract: In this study, we aimed to construct and validate the "Abisus scale", a new tool for assessing exam fear among university students.A set of questions addressed the physical, emotional, behavioral, and cognitive symptoms of exam fear. The first draft of the questionnaire contained 12 questions. Following evaluation by a panel of experts, two questions were deleted, and the second draft included ten questions with a 5-point Likert scale as the scoring key. Following a pilot study, the questionnaire was administered to 115 students, and we discovered that removing the tenth question enhanced Cronbach's alpha. So, we omitted the tenth question and the alpha value increased from 0.781 to 0.811. All calculated coefficients (r) are greater than the critical value (.195), confirming the validity of the exam fear Scale. The developed scale was retested on the same students 6 months later, and the test-retest reliability was calculated using Cronbach's Alpha. The results showed that the exam fear scale is reliable, with Cronbach's Alpha values of.811 [first response] and.767 [second response]. The calculated coefficients (r) are greater than the critical value (.195), indicating the validity of the exam fear scale and demonstrating the consistency of the questionnaire over time.When compared the convergent validity with the established Spielberger Test Anxiety Inventory scale a pearson correlation of 0.56 was obtained indicating an acceptable level of correlation. The severity of exam fear is classified as low (20 or a lower raw score), medium (21-32 raw score), or high (33 or above raw score) using Z score calculation and interpretation. Exam fear was evaluated among participants, and 13% of students were in the low e, 71% in the medium, and 16% in the high exam fear categories respectively.The evolving demands of the modern education system necessitate the development of a novel exam fear scale to effectively assess exam fear among students in modern educational environments, with universities able to utilize the newly developed "Abisus scale" to create stress reduction programs accessible to all students.**

***Keywords:*** *Abisus Scale, Exam Fear, Scale Construction, Scale Validation, University Students.*

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## I. INTRODUCTION

The academic achievement of students is crucial for the development of any country, as it ensures the availability of skilled graduates[1]. Numerous studies have been carried out to examine the different factors that influence students' academic performance. These factors encompass elements such as students' effort, learning preferences, entry qualifications, class attendance[2], anxiety levels[3], motivation, educational supervision[4], and study habits[5]. Generally, students often experience a great deal of fear when it comes to exams. This fear stems from their anticipation of performing poorly and failing, which leads to what is known as examination anxiety. Examination fear is essentially an unpredictable worry about the outcome of one's performance, a fear of being evaluated, and apprehension about the results

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It is characterized by irrational thoughts, unnecessary demands and expectations, and even catastrophic predictions. In fact, examination fear is considered to be a significant factor that contributes to a variety of negative outcomes, including psychological distress, academic underachievement, academic failure, and a general sense of insecurity[6]. Examination fear or anxiety can lead to many problems, which can be physical, emotional, behavioral, and cognitive (Shukla, 2013)[7].

Table 1 Exam Fear Symptoms and its Manifestations

| | |
|---|---|
| Physical symptoms | Increased Heart rate, nausea, stomach upset, sweating, etc. |
| Emotional symptoms | excess fear of failing, disappointment, etc. |
| Behavioral symptoms | procrastination, difficulty in sleeping, etc. |
| Cognitive symptoms | Difficulty in concentration, mental blocks, etc. |

Mandler and Sarason developed the initial measurement tool for assessing examination anxiety in 1952 with 42 items in the questionnaire. Followed by questionnaire developed by Sarason (1958)[8] with 21 items, Sarason (1972) with 37 items, Suinn (1969)[9], Spielberger[10] and its Associates (1980) which consists of 20 items. Many tools can be found in the global perspective with more items to answer, which is actually time-consuming. Here comes the importance of constructing and validating a tool with fewer items, but that covers physical, emotional, behavioral, and cognitive aspects that can assess examination fear among university students in the modern educational environment. So, this research aims at developing and validating a scale that measures the examination fear of university students.

## II. OBJECTIVES

- To construct and validate the "Abisus scale"
- To assess the internal consistency
- To establish the test-retest reliability
- To classify the severity of exam fear
- To propose the newly introduced scale to universities

## III. MATERIAL AND METHODS:

➢ *Population:*

The study was conducted among health university students with the objective of generating and validating a new scale for measuring exam fear among students.

➢ *Sampling:*

The initial phase of the study involved 115 students who were scheduled for exams.

To verify the consistency and accuracy of the responses, the same students' responses are collected in the second phase. It is important to note that students' moods can affect how they respond to questions. Thus, obtaining two answers may mitigate the effect that variations have on the data.

➢ *Questionnaire Generation:*

The first step involved creating a questionnaire with fewer questions to reduce the burden on respondents. This will increase participation and help respondents finish the questionnaire faster, but it also needs to have a better focus to effectively capture the key components of exam fear.

A pool of questions was developed that addressed the physical, emotional, behavioral, and cognitive symptoms of exam fear.

The first draft of the questionnaire consisted of 12 questions

➢ *Expert Review:*

A panel of experts, comprising college professors, counsellors, and psychologists, reviewed the questionnaires to ensure that they were pertinent and complete and that each question directly addressed the intended construct to be measured. As per expert opinion, 2 questions were removed and the second draft consisted of 10 questions.

The constructed questionnaire pattern consisted of 10 questions and the scoring key consisted of a 5-point Likert Scale.

The five options include

Table 2 Likert Scale Scoring Key

| **Rating** | **Strongly Disagree** | **Disagree** | **Neutral** | **Agree** | **Strongly Agree** |
|---|---|---|---|---|---|
| **Score** | **1** | **2** | **3** | **4** | **5** |

- *Pilot Sampling:*

A small sample of participants, including 30 students, were administered the developed questionnaire to evaluate its clarity, comprehension, and redundancy. The students' responses stated that the questions are simple, clear, and easy to understand.

- *Administration of Scale:*

The constructed questionnaire pattern of 10 questions was administered to a group of 115 students who were scheduled for exams. The objective of the study to validate a new exam fear scale was presented to the students before their consent to participate was obtained.

## IV. RESULTS

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Statistical analysis was performed using IBM SPSS Statistics 20

While examining the "Scale of Item deleted" score, we found that Cronbach's alpha value can be improved by deleting the 10th question. Thus, we improved the alpha value from 0.781 to 0.811.

➢ *Reliability:*

Reliability is the measure of the internal consistency of the constructs in the study. A construct is reliable if the Alpha value is greater than .70 (Hair et al.,2013)[11]. Construct reliability was assessed using Cronbach's Alpha. The result revealed that the Exam fear scale with Cronbach's Alpha value = .811(>.70) is found reliable.

➢ *Validity:*

Validity refers to how accurately a method measures what it is intended to measure. Validity was assessed using Pearson's correlation coefficient. A scale is valid if the calculated coefficient is greater than the critical value. The calculated coefficients (r) are given below;

Table 3 Calculated Coefficients(r)

| Question.no | Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 | Q9 |
|---|---|---|---|---|---|---|---|---|---|
| r | .564 | .647 | .667 | .682 | .675 | .614 | .569 | .625 | .642 |
| Sig. | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| N | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 |

The critical value with 113(N-2) degrees of freedom and 5% level of significance is .195. All calculated coefficients (r) are greater than the critical value, so the validity of the Exam fear scale was established.

➢ *Retesting:*

After deleting one question from the constructed 10-questionnaire, the remaining 9-question pattern was administered to the same group of students six months later, who were scheduled to appear in exams.

➢ *Retest reliability:*

Construct reliability was assessed using Cronbach's Alpha. The result revealed that the Exam fear scale with Cronbach's Alpha value = .811[first response] and .767[second response] are found reliable.

➢ *Retest validity:*

Validity was assessed using Pearson's correlation coefficient. A scale is valid if the calculated coefficient is greater than the critical value. The calculated coefficients (r) for the first ($r^1$)and second ($r^2$) responses are given below;

Table 4 The Calculated Coefficients (r) for the First ($r^1$) and Second ($r^2$)Responses

| Question.No | Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 | Q9 |
|---|---|---|---|---|---|---|---|---|---|
| $r^1$ | .564 | .647 | .667 | .682 | .675 | .614 | .569 | .625 | .642 |
| $r^2$ | .683 | .577 | .669 | .659 | .710 | .753 | .627 | .657 | .677 |
| Sig. | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| N | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 |

The coefficient critical value with 113(N-2) degrees of freedom and 5% level of significance is .195. All calculated coefficients (r) are greater than the critical value, so the validity of exam fear scale was established.

➢ *Exam fear scale standardization:*

From the total respondents, Z scores were calculated for each raw score

Table 5 Raw Score Vs Z Score

| Raw Score | Z score |
|---|---|
| 9 | -3.025 |
| 12 | -2.512 |
| 14 | -2.169 |
| 15 | -1.998 |
| 16 | -1.827 |
| 17 | -1.655 |
| 18 | -1.484 |
| 19 | -1.313 |
| 20 | -1.142 |
| 21 | -0.970 |
| 22 | -0.799 |
| 23 | -0.628 |
| 24 | -0.457 |
| 25 | -0.285 |
| 26 | -0.114 |
| 27 | 0.057 |
| 28 | 0.228 |

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| | |
|---|---|
| 29 | 0.400 |
| 30 | 0.571 |
| 31 | 0.742 |
| 32 | 0.913 |
| 33 | 1.085 |
| 34 | 1.256 |
| 35 | 1.427 |
| 36 | 1.598 |
| 38 | 1.941 |
| 41 | 2.455 |
| 43 | 2.797 |

After calculating the raw score, the range of Z scores was divided into 3 categories

- Low Exam Fear
- Medium Exam Fear
- High Exam fear

Table 6 The Categorization of Exam Fear Based on the Z Score Calculation

| Raw Score Range | Z Score Range | Category |
|---|---|---|
| 20 or below | Below -1 | Low Exam Fear |
| 21-32 | -1 to +1 | Medium Exam Fear |
| 33 or above | Above +1 | High Exam Fear |

After checking the reliability and validity of the "Abisus scale", we categorized the exam fear level based on Z score and concluded that the level of exam fear among 13% of students was in the low, 71% in the medium, and 16% in the high exam fear categories, respectively.

➢ *Convergent Validity Analysis*

The Spielberger Test Anxiety Inventory scale(TAI) was administered to the same students along with the Abisus scale to assess exam anxiety, and a convergent validity analysis was done between the Abisus scale and the already established Spielberger Test Anxiety Inventory scale.A Pearson correlation coefficient of 0.56 was obtained, indicating moderate positive convergent validity between the two scales.

Table 7 Convergent Validity Analysis

| Scales Compared | Pearson correlation | Significance p-value | Interpretation |
|---|---|---|---|
| Abisus scale vs Spielberger TAI | 0.56 | <0.01 | Moderate correlation |

## V. DISCUSSION

Multiple research investigations have consistently found a negative correlation between exam anxiety and educational outcomes[12]. University students rarely encounter examination-oriented research studies, especially those focused on validating and measuring exam fear among them. Our research aimed to measure exam fear among university students by constructing and validating the "**Abisus scale,"** a new tool to measure the exam fear of university students, providing helpful information categorizing the level of exam fear and supporting universities in working on stress reduction programs for students.

The modern education system requires a novel, updated exam fear scale to accurately measure exam fear among students in contemporary learning environments. By testing the validity of the "**Abisus scale**," it is proven that the questionnaire measures what it is intended to measure, ie, the exam fear, which ensures the usefulness and credibility of the questionnaire in getting accurate results from the data collected. A high Cronbach's alpha value above 0.70 (0.811) [first response] and 0.767 [second response] suggests that the constructed new exam fear scale, termed the "Abisus scale," is consistent and reliable and can be used for research and assessment purposes. Through repeated testing and retesting of the constructed scale, the results demonstrated the consistency and validity of the questionnaire over time. Convergent validity analysis also showed an acceptable correlation, indicating that the newly developed scale is effective in measuring exam fear among students.

By using Z score calculation and interpretation, the severity of exam fear is categorized into low (20 or below raw score), medium (21-32 raw score), and high (33 or above) raw score. categories. Using the Abisus scale, exam fear was evaluated among the respondents, and 13% of students were in the low exam fear category,71% in the medium exam fear category, and 16% had high exam fear. The newly developed "**Abisus exam fear scale'** has good consistency, reliability, and validity and contains fewer questions (9 questions only), which helps to reduce respondent burden, helps to increase participation, and respondents can complete the questionnaire in less time.

## VI. LIMITATIONS

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Despite being a questionnaire with fewer questions, reducing the burden of respondents,it may not necessarily cover all the aspects of exam fear comprehensively, and may lack the power to discriminate between respondents (students) of varying levels of exam fear. The questionnaire is developed from the responses of university students and may not be appropriate for school students or other populations without validation or reconstruction of the questionnaire.

## VII. CONCLUSION

In conclusion, the **Abisus scale** is a promising tool for evaluating exam fear, providing helpful information for targeted interventions. The **Abisus scale** comprises fewer questions (9 items), which reduces respondent burden, increases participation, and allows respondents to complete the questionnaire in less time. Universities can assess exam fear in students using our newly developed "**Abisus scale**" and must work to guarantee that stress reduction programs are available to all students while also refining initiatives that effectively address the unique needs and concerns of various student populations.

## COMPLIANCE WITH ETHICAL STANDARDS

This manuscript has been prepared in compliance with the ethical standards and relevant research guidelines.

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The authors declared no potential conflicts of interest with respect to the research authorship, and/or publication of article.

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## APPENDIX

The standardized English version of the exam fear scale with 9 questions for university students

- *Abisus Exam Fear Scale Questionnaire*

1. I Feel Tensed or Worry Excessively when Thinking about Upcoming Exams.

| Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

2. I feel any of the Physical Symptoms, such as sweating, an increased heart rate, stomach upset, or nausea, either before or during an exam.

| Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

3. I'm Afraid of Failing Examinations or not Performing Well Enough.

| Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

4. I am worried of Disappointing others or Felt Under Pressure from them, especially my Family Members.

| Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

5. I am not Confident about my Preparation for the Exam.

| Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

6. I experience Mental Blocks find it Challenging to Concentrate on the Exam.

| Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

7. I avoid Study because of Fear or Anxiety.

| Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

8. I often Delay or Postpone my Exam Preparation Tasks due to Procrastination.

| Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

9. I find Difficulty in Sleeping Prior to Exams.

| Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |