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EXAM ANXIETY, SOCIAL SUPPORT AND COGNITIVE INTERFERENCE EFFECT IN YOUNG ADULTS

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Abstract
This study aims to understand the relationship between exam anxiety, social support and cognitive interference effect in young adults. This study was guided by quasi experimental research design, with a sample of 40 young adults from 19 to 26 years of age, who participated voluntarily. The participants completed the demographic form, Westside Test Anxiety Scale and Multidimensional Scale of Perceived Social Support, an hour before their exam. Stroop Neuropsychological Screening Test was used as an experiment to measure participant's cognitive interference effect. For the data analysis, independent t-test, and Pearson product moment correlation and regression analysis, were applied. The result showed that there was no significant relationship between exam anxiety, social support and cognitive interference score in young adults. Family support had a weak negative significant correlation with exam anxiety and cognitive impairment. Moreover, there was no significant difference between males and females on cognitive interference score, and no significant difference between low exam anxiety and high exam anxiety was seen on interference score. On the other hand, there was a significant variance in family and significant other support between those with low and high-test anxiety.

Keywords: Interference effect, exam anxiety, social support, family support, young adults

Introduction
Exam anxiety refers to a severe amount of worry and apprehension about performing poorly before, during or after tests, especially in an academic setting [1]. During exam anxiety, common physical reactions include tense muscles, irregular or pounding heartbeat and difficulty sleeping, breathing too quickly or shallowly, discomfort in the chest, altered appetite, diarrhea or constipation, and back pain [2]**.** Although exam fear is not unreasonable, having too much of it hinders performance. While over-arousal without the anxiety components is only tangentially linked to impairment, worry and dread are thought to interfere with focus and alertness and are closely associated with impairment [3].

Social support is an umbrella expression defined as the resources offered by others having either positive or bad effects through which a person may feel liked, appreciated that leads to the emotional and material assistance helping them to avoid difficulties and more successfully integrate into society [4, 5]. The quantitative measurements of social support and psychological states like anxiety and desperation have a significant negative relationship [6].

The cognitive interference effect is a traditional method for assessing cognitive flexibility. It has evaluated three cognitive abilities: selective attention, the capacity to change one's perceptual set, and the capacity to suppress automatic reactions [7].

Many researchers have examined the effect of anxiety on cognitive abilities. Anxiety can manifest itself in the form of negative thoughts and physiological arousal, which can impair the overall cognitive performance [8]. Working memory which is a component of cognitive abilities. The information that a person is attending to is integrated, computed, stored, and manipulated by working memory, which is generally understood to be a limited capacity system [9]. According to Baddeley's multi-component model, a domain-general central executive is responsible for managing and coordinating the information active in working memory. It is impacted by anxiety because the worries that people have when they are nervous divert working memory resources from the activity at hand (e.g. completing a math's exam) to anxious thoughts. People who are concerned therefore appear to be doing two things at once-concentrating on their activity and their negative thoughts and second, when they multitask, the working memory resources are reduced for the primary task, which is why they do less well when they are nervous [10].

According to the attachment theory, children's interactions with their parents or primary caregivers help them form internal representations of relationships that they later use to support other relationships. A "persistent psychological connection between people." is an attachment [11, 12]. Nurturing relationships are essential to a child's healthy growth that may have an impact on child's future social, cognitive, and emotional development [13]. The knowledge of child psychology, social development, and mental health have been influenced by this field's emphasis on the significance of early emotional attachments in human development. When a child experiences the loss of an attachment figure, it frequently experiences anxiety and grief, which may hinder its social and emotional development [14].

Erik Erikson's psycho-social development concept states that people go through eight phases of personality development from infancy to old life. The social engagement is good to have at all ages. People must successfully finish each step and strike a balance between two opposing states only then can people acquire core human virtues and a healthy personality. The young adult years correspond to the sixth stage of psycho-social development paradigm, span the years 18 to 40. People try to make longer-term commitments outside of families during this time, with varied degrees of success. Positive outcomes yield safe, long-lasting, and healthy partnerships that foster the attribute of love. Feelings of loneliness, grief, and unhappiness can result from failing to form positive relationships [16].

Interference effect is much important to study as it indicates many aspects of human cognition [17] but altogether, a huge literature gap can be seen on exam anxiety and social support along with interference effect to measure cognition, including young adults. Changes in cognition may occur highly in exam anxious students as anxiety can result alter in negative thoughts and physiological arousal that can impair performance on cognitively demanding tasks [9]. The social assistance of family, friends and other people must be considered as an important factor to study with young adults as theories are evident that early child's relationship with caregivers affects all aspects of that child's life and they become socialize to gain social support at young adults age (above 18 years)**.** This study results will be beneficial to improve students' knowledge of this subject and to evaluate possible interventions to assist them in managing their exam anxiety on their own as students are better able to manage their own anxiety when they have a variety of coping mechanisms at their hands. Also, to help them balance their cognition, attention and their perception not only for the sake of students' mental and physical health but also, for more positive impact on educational institutes who play important role in educating and spreading awareness in students. The current study's major goal is to

investigate the relationship between young adults' exam anxiety and social support networks in relation to the interference effect.

Objectives:

- To find out the relationship between exam anxiety (and its categories impairment and worry), social support including its sub-scales (significant other, family and friends support) and cognitive interference effect in young adults.
- To find out the impact of exam anxiety and social support on cognitive interference effect in young adults.
- To determine the gender difference in young adult students with cognitive interference effect in young adults.
- To find out the difference between low exam anxious and high exam anxious young adult students with cognitive interference effect in young adults.
- To find out the difference between low exam anxious and high exam anxious young adult students with social support and its sub-scales in young adults.

Hypotheses

- There will be a significant relationship between exam anxiety and its sub-scales (impairment and worry), social support including its sub-scales (significant other, family and friends support) with and cognitive interference effect in young adults.
- There will be a significant impact of exam anxiety and social support on interference effect in young adults.
- There will be a significant gender difference between with cognitive interference effect in young adults.
- There will be a significant difference between low exam anxious and high exam anxious young adult students with cognitive interference effect in young adults.
- There will be a significant difference between low exam anxious and high exam anxious young adult students with social support and its sub-scales in young adults.

Methodology

Research Design

To explore the relationship between exam anxiety, social support and cognitive interference effect in young adults, quasi experimental design was applied.

Participants

Data was collected by 40 young adults before their exam. Purposive sampling technique was used to get 20 female young adults and 20 male young adults. Exam Anxiety scores were administered before the experiment, and in both groups males and females 10 participants had low anxiety and 10 had high anxiety. Both young adult male and female as students were included between the ages of 19 to 26 years of all programs either of bachelor's degree or master's degree.

Measures

Demographic information.

Questions were asked about gender, age, birth order, number of family members, family style, social economic status along with current education degree.

Multidimensional Scale of Perceived Social Support (MSPSS)

The Multidimensional scale of perceived social support was used to assess social support [18]. There are 12 items on the 7-point response scale, 1 representing very strongly disagree and 7 representing very strongly agree. The three distinct groups are regarded to be: friends, family, and a significant other (four items each). Scale items include matters like "I get the emotional help and support I need from my family" and "I can count on my friends when things go wrong". Subject’s score ranging

from 1 to 4 is considered as low social support and high social support includes score from 4.1 to 7. The scale's overall reliability along with the internal reliability of sub-scales were determined using Cronbach's coefficient alpha. The values were .83, .78, and .82 for the Significant Other, Family, and Friends sub-scales, respectively. The entire scale's reliability was 0.86.

Westside Test Anxiety Scale (WTAS)

A ten-item questionnaire called the Westside Test Anxiety Scale is used to identify students who exhibit impairments due to anxiety [19]. Point 5 on the scale corresponds to "not at all or never true," whereas "extremely or always true" is point 1. Four items on the Westside Test Anxiety Scale assess worry and dread (items 2, 3, 7, and 9) which reduces focus and concentration, and six items indicate impairment (items 1, 4, 5, 6, 8, and 10) such as poor cognitive processing. The sum of the individual item responses yields the scores for these two sub-scales. Score ranging from 1.0 to 2.5 is considered as low exam anxious. Whereas scores above than 2.5 is considered as high exam anxious participants. The scale's overall reliability along with the internal reliability of each sub-scale were determined using Cronbach's coefficient alpha. The values were .74 and .69 for the impairment and worry sub-scales, respectively. The entire scale's reliability was 0.83.

Stroop Neuropsychological Screening Test (SNST)

The interference effect of the Stroop Neuropsychological Screening Test (SNST) was employed to assess the excess subject's cognitive abilities [20]. Form C stimulus sheets, Form C-W stimulus sheets, the Professional Manual, and SNST Record Forms make up Stroop Neuropsychological Screening Test. 112 color names (red, green, blue, tan) are included in the Form C Stimulus Sheet, arranged in 4 columns of 28 names. Each name is printed using one of four distinct ink colors (red, green, blue, or tan), with no name printed in the same color (blue, for example). Other than the color names sequence, the Form C-W Stimulus Sheet is identical to the Form C Stimulus Sheet. The Color and Color-Word Tasks are administered using the Form C and Form C-W Stimulus Sheets. The four-page booklet is the Stroop Neuropsychological Screening Test Record Form which is used to record clinical data, demographic information, Color and Color-Word Tasks responses, and Stroop Neuropsychological Screening Test scores.

Procedure

The universities psychology lab was used for data collection and to perform Stroop Neuropsychological Screening Test (SNST) experiment. The environment was controlled with comfortable seats, no distraction, and sufficient lightning normal reading specially for Stroop Neuropsychological Screening Test. The data was collected one hour before the exam started. 40 students participated in the study voluntarily. All participants were tested individually in the psychology lab.

Firstly, participants signed the informed consent. Secondly, each of the participants was provided questionnaires along with demographic information and asked them to fill. Each questionnaire took 3 minutes. After questionnaires completion, participants performed Stroop Neuropsychological Screening Test for this experimental study. Before presenting the two stimulus sheets, the participants' accuracy of identification of the four colors were tested by asking them to name the color of familiar objects in the testing environment, in accordance with instructions [19]. The initial task for each participant was to read aloud the words from the Form C Stimulus Sheet column as soon as they could, going from top to bottom within 120 seconds. In another 120 seconds, they were instructed to name the color of the ink-red, blue, green or tan from Form C-W Stimulus Sheet, as quickly and accurate as possible. The time was measured using stopwatch. When the allotted 120 seconds had passed, the total number of things done was noted. In total, 15 minutes were provided to each participant including guidance and instructions.

Statistical analysis

SPSS software was used to analyze the data. Using Pearson product moment correlation in inferential analysis, the association between exam anxiety, social support and interference effect is investigated. Regressions analysis was used to see the impact of exam anxiety and social support on interference effect. Also, independent t-test was applied to identify gender differences, and low and high exam anxiety sensitivity. 0.05 was set as an alpha value. Central tendencies (mean, mode and median) along with standard deviation were included in descriptive analysis.

Results

Total sample included 40 participants in which 20 were males (50%) and 20 were females (50%). The age range of participants was from 19 to 26 years with mean age of 20.95 (*SD* = 1.78). Majority of participants were doing bachelor's degree. Eldest and youngest child participants were of high rate. Most of the participants had average 4.35 family members (*SD* = 1.51) with neutral family style. Most of the participants had mean 4.4 number of friends (*SD* = 3.11) and thought of having good social support. Whereas, most of participants belonged to middle class families [Table 1].

Table 1: Sociodemographic Characteristics of Participants at Baseline

Baseline	Full Sample			
characteristics	*n*	*M*	*%*	*SD*
Gender				
Male	20		50	
Female	20		50	
Current degree				
Bachelor's	37		92.5	
Master's	3		7.5	
Age	40	20.95	100	1.78
Birth order				
Elder child	14		35	
Middle child	12		30	
Youngest child	14		35	
Family members	40	4.35	100	1.51
Family style				
Neutral family	29		72.5	
Joint family	11		27.5	
Number of friends	40	4.4	100	3.11
Good social support				
Yes	32		80	
No	8		20	
Socioeconomic status				
Lower class	0		0	
Middle class	36		90	
Upper class	4		10	

The Westside Test Anxiety Scale (WTAS) developed to measure exam anxiety with Cronbach's alpha value .83. The reliability values were .74 and .69 for the Impairment and Worry sub-scales, respectively. The Multidimensional Scale of Perceived Social Support (MSPSS) developed to measure social support consist of .86 reliability. The values were .83, .78, and .82 for the Significant Other, Family, and Friends sub-scales. Stroop Neuropsychological Screening Test (SNST) was used to measure interference effect and had reliability of .65 due to low number of items [Table 2].

Table 2: Psychometric Properties for WTAS, MSPSS Scales and Sub-scales and SNST Experiment

Scale	*M*	*SD*	Range	Cronbach's α
WTAS (Exam Anxiety)	2.6	.86	1.10 - 4.40	.83
Impairment	2.66	.86	1 - 4.5	.74
Worry	2.53	.99	1 - 4.5	.69
MSPSS (Social Support)	4.82	1.21	1.58 - 7	.86
Significant other	4.61	1.63	1.5 - 7	.83
Family	4.97	1.44	1.5 - 7	.78
Friends	4.97	1.44	1.5 - 7	.82
SNST (Interference effect)	97.8	11.83	71 - 111	.65

The Stroop Neuropsychological Screening Test (SNST) experiment had two stimulus sheets Form C Stimulus Sheets and Form C-W Stimulus Sheets along with Scores, percentile and *Pr* value to predict cognitive abilities. Three variables were measured including both C stimulus sheet and C-W stimulus sheet, the following are calculated: (i) the number of items completed; (ii) the total number of incorrect responses; and (iii) the interference score, which is determined by subtracting the total number of items completed in 120 seconds from the number of incorrect responses [Table 3].

Table 3: Summary of Stroop Neuropsychological Screening Test Experiment

Scale	*M*	*SD*	Range
Form C Stimulus Sheet			
Items completed	112	00	112
Incorrect responses	.45	.71	.00 - 3
Interference Score	111.3	1.95	100 - 112
Form C-W Stimulus Sheet			
Items completed	102.65	11.09	73 - 112
Incorrect responses	4.82	3.9	1- 16
Interference Score	97.8	11.8	71 - 111
Percentile	27.62	19.5	2 - 69
Pr Value (Brain damage)	.49	.25	.05 - .95

Person product moment correlation analysis was done on exam anxiety with sub-scales (impairment and worry), social support with sub-scales (significant other, family support, friends support) and interference effect. Family support is low negative significantly correlated with exam anxiety (r = -.33*, p=.03) and impairment (r= -.363*, p=.02). The higher the family support is, the lower is exam anxiety and impairment [Table 4].

Table 4: Pearson Product Moment Correlation analysis between Exam Anxiety and its sub-scales, Social Support including its sub-scales and Interference Effect

5	-							
6	.465**	-						
7	.447**	.441**	-					
8	-.03	-.022	-.123	-				

Variable	*n*	*M*	*SD*	1	2	34
1 Exam anxiety	40	2.6	.86	-		
2 Impairment (EA)	40	2.66	.86	.957***	-	
3 Worry (EA)	40	2.53	.99	.892***	.736***	-
4 Social support	40	4.82	1.21	-.246	-.254	-- . 1 7
5 Significant other	40	4.61	1.63	-.257	-.210	-.821*** . 2 -
6 Family support	40	4.97	1.44	-.33*	-.363*	-.782*** . 2 3
7 Friends support	40	4.97	1.44	-.033	-.06	..763*** 0 4 3
8 Interference effect	40	97.8	11.83	-.049	-.037	-.096 . 0 4 4

Since there is no meaningful correlation between social support and interference effect, the assumption of regression analysis is not fulfilled. Hence, the third hypothesis of regression analysis to see the impact of exam anxiety and social support on interference effect cannot be utilized.

Independent sample t-test was run on gender and interference score. There has been no statistically significant difference between males and females on interference score. Mean parameter values for are shown for male (n = 20) and female (n = 20), as well as the results of t tests (assuming equal variance) comparing the parameter estimates between the two genders [Table 5].

Table 5: Results of Independent sample t-test Analysis Examining the Gender on Interference Effect

Variable	Male		Female		t(38)	*p*	95% CI		Cohen's *d*
	M	*SD*	*M*	*SD*			LL	UL	
Interference effect	97.25	12.13	98.35	11.81	-2.90	.77	-8.76	6.56	0.09

Independent sample t-test was run on exam anxiety level and interference score. There has been no statistically significant difference between low exam anxiety and high exam anxiety on interference score. Mean parameter values for are shown for low exam anxiety (n = 20) and the high exam anxiety (n = 20), as well as the results of t tests (assuming unequal variance) comparing the parameter estimates between the two exam anxiety levels [Table 6].

Table 6: Results of Independent sample t-test Analysis Examining the Low Exam Anxious and High Exam Anxious on Interference Effect

Variable	Low exam anxious		High exam anxious		t(38)	*p*	95% CI		Cohen's *d*
	M	*SD*	*M*	*SD*			LL	UL	
Interference effect	100.35	9.93	95.25	13.23	1.37	.17	-2.41	12.61	0.43

Independent t-test was run on exam anxiety level and social support along with its sub-scales (significant other, family support, friends support). There is a significant difference between low exam anxiety (M= 5.18, SD= 1.37) and high exam anxiety (M= 4.04, SD= 1.69) on significant others ($t_{(38)}$= 2.32, p= .025) with large effect size (Cohen's d= .74), and on family ($t_{(38)}$= 2.5, p= .017) with large effect size (Cohen's d= .80). Mean parameter values for are shown for low exam anxiety (n = 20) and the high exam anxiety (n = 20), as well as the results of t tests (assuming equal variance) comparing the parameter estimates between the two exam anxiety levels [Table 7].

Table 7: Results of Independent sample t-test Analysis Examining the Low Exam Anxious and High Exam Anxious on Social support and its Sub-Scales

Variable	Low exam anxious		High exam anxious		t(38)	*p*	95% CI		Cohen's *d*
	M	*SD*	*M*	*SD*			LL	UL	
Social support	5.15	1.11	4.49	1.24	1.76	.08	-.09	1.41	.56
Significant others	5.18	1.37	4.04	1.69	2.32	.025*	.14	2.1	.74
Family	5.51	1.36	4.43	1.33	2.5	.017*	.20	1.93	.80
Friends	4.86	1.6	5.08	1.29	-.48	.628	-1.15	.70	.15

Discussion:

Following the first principal hypothesis in table 4, the family support (social support subscale) has a moderate negative relationship with exam anxiety and its subscale of impairment. The greater the family support is, the lesser the exam anxiety is. The same way, higher family support results in less impairment in cognition and attention loss**.** It is supported by previous studies who found out the significant negative relationship of social support with exam anxiety concluded that the more social support the children felt, the lower the level of exam anxiety they experience [21,22]. The third hypothesis of regression analysis to see the impact of exam anxiety and social support on interference effect cannot be utilized because there is no significant correlation between them.

In table 5, independent t-test analysis was done on 50% of male young adults and 50% of female young adults. It showed that female reported a little bit high level of interference effect than male but no significant gender difference on interference score which indicates that gender plays no significant difference of role in individual's cognition. It is consistent with other research that found no significant differences between male and female in attention before test situation [23].

Table 6 show that low exam anxious young adults reported high level of interference effect than high exam anxious young adults but no significant difference between low exam anxious and high exam anxious on interference score was seen. Same result is supported in previous study whose findings refute the widely held belief that anxious individuals score higher on the Stroop Test than non-anxious individuals [24].

Independent t-test was applied in table 7 in which significant difference was seen on significant other support and family support with large effect size reported a high level of social support including significant other, family and friend than high exam anxious young adults. Low exam anxious reported a bit high level of social support than high exam anxious. It is supported by the attachment theory in which a child experiences the loss of an attachment figure through which they frequently experience anxiety and grief, which may hinder their emotional and social growth and to have good mental health, children need strong attachment ties with their parents [13, 14].

Implications

An important issue that affects many students' both physical and mental health is exam anxiety. There were participants who faced high exam anxiety due to low social support and performed poor on SNST. Enhancing students' physical and mental health literacy should be a top priority for educational institutes. It is important to screen young adults for anxiety and to take the appropriate safety measures for both the students and their families. Educational psychologists may work with schools to support these efforts. Staff may also play important role in teaching students more about exam anxiety and how to cope with it. Other strategies for addressing pre-exam anxiety include avoidance, seeking social support, and task orientation and preparation. The application of cognitive behavioral approaches to larger group settings in educational institutes is feasible, and they can be useful in managing students' exam anxiety when paired with additional techniques like relaxation. It can be decreased by knowing when and how to use relaxation techniques, which include deep breathing, closing your eyes, concentrating on relaxing one muscle at a time, and visualizing a successful conclusion that will support you in remaining calm and confident before and during the exam. It is necessary to have good diet and stay hydrated. For brain to work, it needs fuel.

Limitations

As the data collection is done by only one university instead of getting it from few more universities, this may cause the limitation in research and can affect the results which are not significant. Random sampling can also be used for better significant results. Also, the sample size of this research is 40 participants that may result in the non-significant hypotheses. Large sample size may cause significant results.

Conclusion:

In conclusion, the main objective of this research was to study the relationship between exam anxiety, social support and interference effect in young adults of University of Central Punjab, Lahore. This research consists of quasi experimental research design in which the data was collected through experiment of Stroop Neuropsychological Screening Test (SNST) and two questionnaires. The findings indicate that there is no significant correlation between exam anxiety, social support, and interference effect. Significant correlation was seen between signification other support, exam anxiety and impairment. Exam anxiety level differences was significant on social support sub-scales including significant others support and family support.

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