Relationship of Depression, Anxiety, Stress and Job Burnout with Teachers' Working Memory

Hellema Jahantigh [1] iD, Mahmoud Shirazi [2*] iD, Amir Abas Alipoor [3] iD

[1] MSc, Department of Psychology, Faculty of Educational Sciences and Psychology, University of Sistan and Baluchestan, Zahedan, Iran.. E-mail: hellema.gahantigh@pgs.usb.ac.ir

[2] *Corresponding author*, Associate Professor, Department of Psychology, University of Sistan and Baluchestan, Zahedan, Iran. E-mail: mshirazi@edpsy.usb.ac.ir

[3] MSc, Department of Psychology, Faculty of Educational Sciences and Psychology, University of Sistan and Baluchestan, Zahedan, Iran.. E-mail: alipoor.amir79@bums.ac.ir

A B S T R A C T

Job burnout causes a reduction in productivity and reduces the availability of human resources, which has negative effects on individuals, families, and society as a whole. The main goal of this research was to investigate the connections between stress, depression, anxiety, job burnout, and teachers' working memory. The research sample consisted of educators from Zabol city in the academic years 2022-2024. Cluster random sampling was used to select 120 teachers for both descriptive and correlational analyses. To collect the Working Memory Questionnaire developed by Daneman & Carpenter (1980), DASS-21 assessing the level of stress, anxiety, and depression, Job burnout using the Maslach and Jackson's (1980) Burnout Inventory (MBI) were applied. To analyze the data Pearson's correlation coefficient, and stepwise regression analysis was used to investigate the connections between stress, depression, anxiety, job burnout, and working memory. The results revealed a significant association between these factors. Regression analysis indicated that burnout was the most important factor in predicting teachers' working memory when compared to the other three variables.

Introduction

Different work environments are usually associated with tensions and pressures that endanger the health and well-being of employees and make them suffer from mental stress. As a result of these pressures, the initial strength and energy of the employees will gradually decrease and their efficiency and effectiveness will decrease. (Ashoori, 2017). Teachers are considered pivotal components within the educational framework due to their profound influence as individuals. Over recent years, educators have grappled with an array of challenges, encompassing diminishing social standing and financial stability attributed to inadequate remuneration, extended working hours, unfavorable work environments, and absence of job incentives, bureaucratic hurdles, and societal scrutiny. These challenges, in conjunction with psychological stressors, precipitate job burnout. Educators rank among the professional cohorts

particularly susceptible to work-induced stress, which may culminate in burnout syndrome (Bermejo, Prieto, & Hernández, 2016).

The stress and its complications cause hundreds of business days every year, and about 1 million people refuse to attend work due to stress disorders daily (Dehdashti, et al. 2018). These stresses and pressures may cause disruption and dissatisfaction and lead to job exhaustion (Ashoori, 2017). Teachers are equally susceptible to job burnout functioning as significant agents driving development and advancement. The arduous responsibilities and obstacles they encounter within educational settings, emanating from superiors, guardians, and colleagues, alongside the perpetual endeavor to manage disruptive student behavior, engender sustained stress and anxiety. Failure to effectively navigate the pressures inherent in the educational milieu through scientific and efficacious strategies can precipitate overwhelming stress. Furthermore, challenges associated with social dynamics and meeting fundamental needs serve to exacerbate teachers' stress and apprehension (Mehrabizade Honarmand et al, 2013).

Teaching ranks as one of the top ten most stressful careers globally, with a third of teachers considering it extremely stressful (Allison, 2017). In the Male & May research, 80% of British educators perceive themselves as highly stressed, and over 50% indicated they were actively looking to leave their jobs (Barzegar Bafrooee, 2011). These studies have also found that teachers experience high levels of job dissatisfaction and depression, with stress being a common aspect of teaching. While some stress can benefit performance, excessive stress can lead to various negative effects such as physical and mental fatigue (Pourghane et al., 2010). Steptoe and his team assert that insufficient resources or maladaptive coping mechanisms can result in prolonged exposure to stressors causing short-term reactions like physiological changes, reduced performance, failure, anger, and irritability. Prolonged stress can lead to short-term reactions turning into long-term reactions, leading to issues like psycho-physical problems, anxiety, physical problems, depression, and absenteeism (Babamiri et al. 2015).

Among the variables associated with job burnout, long-term stress in the workplace has been proposed as one of the serious risk factors of job burnout (Fangyuan et al. 2021. Szczygiel, Mikolajczak. 2018). A study conducted on employees of Yazd hospitals, a significant relationship between occupational stress and burnout was found (Abarghouei et al. 2016). Stress and mental pressure are an integral part of any job and the amount of this stress is different in different jobs (Dehdashti, et al. 2018). A comparative investigation into the mental well-being of educators, juxtaposed with other professions, reveals a higher propensity among teachers to endure chronic fatigue, mental disorders, depression, anxiety, and burnout. This finding is further corroborated by research indicating elevated levels of occupational stress among educators compared to cohorts in other high-risk vocations (Covess et al., 2006). Burnout, an outcome of prolonged work-related stress, manifests as a psychological symptom that is increasingly prevalent in contemporary society (Melamed et al., 2006). The concept was first explained by Freudenberger (1974). Freudenberger (1974) observed that people experiencing burnout show comparable behavior to individuals suffering from depression, indicating a potential connection between work-related pressures and the onset or worsening of burnout. However, there is still uncertainty in the literature about the differences between burnout and depression, as shown by the research of Hakanen and Schaufeli (2012). Recent studies have shown that organizations are facing a crisis of employee burnout (Abarghouei et al., 2016; Elshaer et al., 2018).

Another factor that seems to be linked to burnout, although not as widely researched alongside it as depression, is anxiety (Sun et al., 2012). Anxiety, a common psychological state, acts as a defense mechanism against dangerous situations. Extended periods of anxiety can cause mental distress, impacting how a person goes about their day (Cole, 2014). Mark and Smith (2012) identified a correlation between elevated anxiety levels and job demands, extrinsic effort, and over-commitment. The impact of stress within organizations stands as one of the significant factors influencing individual performance and posing a threat to overall health. Over the past decade, stress and its implications for organizations have garnered substantial attention in the field of organizational behavior (Rezaian, 2003). Occupational stress can lead to various adverse outcomes and, in severe cases, permanent damage for both individuals and

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organizations. The results of Kuchinsky (2006) showed that teachers, doctors, and workers face with high job stress and these jobs are ranked as the first three jobs in the United States in terms of job stress.

Memory is one of the cognitive systems that receives, stores and retrieves information at the same time. There are different types of memory, including long-term, short-term, and temporary or working memory. Working memory is a theoretical concept in cognitive psychology that plays a central role in cognition (Kalantar Ghoreishi et al., 2012). The temporary storage and conscious elaboration of inputs to perform complex tasks such as thinking, learning, perception, and reasoning is guided by working memory (Baddeley, 2003). One of the ways to improve the quality of memory performance is to increase the capacity of working memory by reducing the extra cognitive load that is imposed on it. Based on research, stress is one of the factors that imposes a great burden on memory capacity (Khaier et al., 2014). Working memory is distinct from short-term memory because it includes the active processing of information, not just the temporary storage of information as seen in short-term memory (Baddeley, 2000). Memory capacity is a way to measure the quantity of information that can be held. In the meantime, memory duration indicates how long information can be retained in a memory system (McLeod, 2007). working memory is defined as capacity of the quantity of information that could be held in working memory during information processing, and this capacity was typically restricted (Conway & Engle, 1996) stated. Engle (2002) demonstrated in his study that working memory capacity is crucial in aiding cognitive functions related to problem understanding, reasoning, and problem-solving, and noted that individuals possess varying levels of working memory capacity.

The idea of operational or active memory was first introduced in 1974 by Baddeley and Hitch (Alloway, 2009). They claimed that despite some similarities, short-term and active memory were distinct from one another. Short-term memory handles temporary information independently from long-term knowledge, while active or working memory processes temporary information simultaneously and in parallel using a multi – part system. Active memory is where the mind processes information, arranges it for storage or deletion, and interacts and shares with other information (Rezaei and Boostan Zar, 2016). In certain writings, the concept of active memory being identical to consciousness has been suggested (Ezquilt et al., 2010; Azizinjad, 2014).

Working memory is a dynamic system that is actively used to temporarily store and manipulate information to support complex cognitive tasks like learning, reasoning, understanding, and thinking. Moreover, working memory is closely linked to the information that needs to be moved to long-term memory (Karimi and Askari, 2013). Research has demonstrated that individuals with high intelligence and memory skills make fewer mistakes in comprehending and remembering information compared to those with low intelligence and memory capabilities (Carretti et al., 2005; Zahmatkesh et al., 2014). Increased anxiety decreases the ability to push away intrusive thoughts, leading to more working memory being used for worrying. This results in a decrease in the patient's ability to solve cognitive interference during tasks, leading to decreased efficiency (Mirabolfathi et al., 2016; Schmeichel, 2007; Brewin and Smart, 2005).

Considering that teaching is one of the occupations that can increase negative emotions, especially depression, stress and anxiety, and these factors can eventually lead to burnout among teachers, so teachers' working memory can be affected by negative emotions and Job burnout. So far, no research has been done on teachers regarding the relationship between depression, anxiety, and stress and job burnout with working memory among teachers. Therefore, the current research tries to investigate whether these variables have a significant relationship or not.

Method

Sample and Sampling Method
This study employed descriptive-correlational research design. The study population comprised teachers from Zabol city during the 2022 – 2024 academic years. The statistical sample consisted of 120 teachers

who reported the highest levels of stress. Participants were randomly selected through cluster sampling. All statistical analyses were performed using SPSS – 26 software.

Tools Used

Depression, Anxiety, and Stress Scale-21 Items (DASS-21)

In 1995, Lovibond and Lovibond developed a 21-item-scale to assess stress, anxiety, and depression. Each question's scoring system was 0 (it does not happen to me at all or never) to 3 (much or often applicable to me). Anxiety (items 2, 4, 7, 9, 15, 19, 20), stress (items 1, 6, 8, 11, 12, 14, 18), and depression (items 3, 5, 10, 13, 16, 17, 21). The validity of .77 for this scale was also reported by (35). Each subscale contained seven items whose final score could be obtained through summing the items varying from 0 to 21 per sub-scale. The reliability of DASS-21 showed that it has excellent Cronbach's alpha values of .81, .89, and .78 for the subscales of depressive, anxiety and stress respectively. It was found to have excellent internal consistency and discriminative, concurrent, and convergent validity. In Iran, the DASS-21's internal consistency was measured at .82 through Cronbach's alpha, and the reliability of DASS-21 scale was confirmed by examining retest coefficients. Also Musa et al., (2007) reported adequate level of internal reliability for this measure.

Maslach Burnout Inventory (MBI)

The (MBI) is a widely utilized instrument for assessing job burnout. This inventory comprises 22 questions that explore emotions and attitudes to evaluate various dimensions of burnout syndrome (Maslach et al., 1986). The MBI is divided into three subscales: emotional exhaustion, depersonalization, and personal accomplishment. Nine items focus on emotional exhaustion, allowing respondents to report feelings of extreme fatigue and emotional depletion related to their interactions with clients and their workplace environment. Five items address depersonalization, where respondents can express feelings of apathy and indifference towards their clients. The remaining eight items pertain to personal accomplishment, enabling respondents to indicate their perceived level of competence and success in their professional responsibilities towards their clients. The intensity of these emotions and attitudes is measured using a Likert scale ranging from 0 (never) to 6 (every day). Based on the scores in each subscale, the level of burnout is classified as low, moderate, or severe.

Mulki et al's study found that Maslach and Jackson's 9-item questionnaire to measure job burnout demonstrates good validity, reliability, and supporting evidence. Verification of the questionnaire's factor structure was conducted using confirmatory factor analysis with 9 questions, confirming its validity as established by Mulki et al (2006). With Cronbach's alpha of .89 a study in Iran by Golparvar et al (2010). Further validated the questionnaire's reliability and validity through Pearson's correlation coefficient and regression analysis, showing significant predictive capability (p < .01 or < .01 p).

Reading Span Task (RST)

This scale was devised by Daneman & Carpenter (1980) to assess the level of reading span task of individuals. This test consists of 27 sentences divided into six sections: two-sentence, three-sentence, four-sentence, five-sentence, six-sentence, and seven-sentence sections. In each section, participants encounter sentences of varying lengths, designed to be challenging and unrelated. Participants must complete two tasks for each sentence:

1.   Determine whether the sentence is semantically accurate.
2.   Record the final word of each sentence.

The first section assesses the processing level, while the second part evaluates the accumulation level. To measure active memory capacity, the number of accurate responses in each category is divided by the total number of sentences. The resulting figures from each category are averaged to indicate memory capacity level. Each participant actively engages in the test. This test can be administered in different formats. One method involves participants reading sentences aloud from cards, then briefly looking away, and responding after one and a half seconds. The participants may silently read the sentences and follow the same instructions. Studies have indicated a strong correlation between all three formats. This test also shows a significant correlation with other assessments, such as a verbal academic aptitude test (correlation coefficient of .59) and specific reading comprehension tests, including the real question test and the demonstrative pronoun question.

The primary characteristic of this assessment is the concurrent evaluation of two elements of active memory, specifically processing and storage during a cognitive task. Asadzadeh (1388) reported a reliability coefficient of .88 for this test. Additionally, the working memory capacity test showed a correlation coefficient of .59 with the verbal academic aptitude test, while the factual questions test and pronoun questions test each had a correlation coefficient of .72. It has been reported by Daneman & Carpenter (1980) that the amount is 0.90. The results mentioned indicate the test's high reliability and validity coefficient.

Procedure

Ethical principles and human values were strictly followed in all stages of the research outlined in the article above. As an academic scholar, skilled researcher, and experienced editor, it is crucial to emphasize the significant role of prioritizing ethical concerns to protect the well-being and rights of all participants. Before starting the study, great care was taken to ensure that all participants could give informed consent, which included detailed information on the study's goals, methods, and possible risks. Stringent actions were implemented to maintain confidentiality and anonymity, guaranteeing that only authorized

individuals have secure and exclusive access to data. Furthermore, participants were clearly informed of their ability to exit the study at any point without facing any negative consequences. The study strictly followed the rules outlined by relevant institutional review boards, as well as the ethical principles explained in the Declaration of Helsinki. This consistent commitment to ethical behavior emphasizes the integrity and credibility of the research results, as well as highlighting the deep respect and well-being provided to all participants.

Results

A range of descriptive statistics including frequency, percentage, mean, and standard deviation were employed in analyzing the data. The Pearson's correlation coefficient and stepwise multiple regression analyses were conducted to elucidate the interplay between stress, anxiety, depression, and job burnout variables with working memory. Tables 1 and 2 encapsulate a comprehensive summary of the data pertaining to the study participants.

Table 1. Frequency Distribution of Variables

Variables	Groups	Frequency	Percentage
Gender	Woman	73	61%
	Man	47	39%
	Total	120	100%
Age	Less than 30 years	19	16%
	Between 30-40	49	41%
	Between 40-50	39	32%
	More than 50 years	13	11%
	Total	120	100%
Education	Diploma	11	9%
	Bachelor Degree	58	48%
	Master Degree	37	30%
	Ph.D. degree	14	13%
	Total	120	100%
Job tenure	Less than 10 years	42	35%
	Between 10-20	38	31%
	More than 20 years	40	34%
	Total	120	100%

Table 1 illustrates frequency and percentage distribution of demographic characteristics, namely gender, educational level, and marital status.

Table 2.Mean and SD of depression, anxiety, stress, job burnout, working memory

Variable	Mean	SD
Depression	27	7,39
Anxiety	18	4,62
Stress	31	5,32
Job burnout	84	11,68
Working memory	38	8,44

Table 2 presents the descriptive statistics, including the mean and standard deviation, for the research variables. As depicted in the table, the average score for the stress component is 31, for the anxiety component is 18, for the depression component is 27, for the burnout component is 84, and for the

working memory component is 38. The correlation between these components was assessed utilizing Pearson's correlation coefficient.

Table 3. Correlation coefficient of parameters of depression, anxiety, stress, job burnout and working memory

Variable	1	2	3	4	5
Stress	1				
Depression	.312**	1			
Anxiety	.542**	.617**	1		
Job burnout	.167*	.349**	.585**	1	
Working memory	-.218**	-.761**	-.364**	-.729**	1

The results of table 3 illustrate that working memory was significantly negatively correlated with stress (r= -.218, p<.01), depression (r= -.761, p<.01), anxiety (r= -.364, p<.01), and job burnout (r= -.729, p<.01).

To delve deeper into this relationship, a step-by-step regression analysis is employed for further investigation.

Table 4. Stepwise regression analyses of Anxiety, Stress and job burnout

Model	R	R^2	Unstandardized Coefficients		Standardized Coefficients		
			B	Std. Error	B	t	Sig.
Constant	.641	.410	15.704	.678	___	23.177	.0001
Burnout	.729	.531	-.094	.026	-.181	-3.609	.0001
Anxiety	.598	.357	-.018	.006	-.149	2.968	.003
stress	.611	.373	-.038	.015	-.128	2.548	.011

The table presents the stepwise regression analysis examining the relationship between anxiety, stress, job burnout, and teachers' working memory. The model includes unstandardized coefficients and standardized coefficients for each predictor variable. The fixed coefficient represents the intercept of the regression equation, indicating the expected value of the dependent variable (working memory) when all predictor variables are held constant at zero. In this analysis, the constant coefficient is 15.704 (SE = .678, t = 23.177, p < .001), suggesting that when anxiety, stress, and job burnout are absent, the predicted working memory score for teachers is approximately 15.704. Regarding the predictor variables, job burnout shows a statistically significant negative relationship with working memory (β = -.181, SE = .026, t = -3.609, p < .001). This indicates that as levels of job burnout increase, teachers' working memory tends to decrease, holding other variables constant. Anxiety also demonstrates a significant negative association with working memory (β = -.149, SE = .006, t = 2.968, p = .003). Higher levels of anxiety are associated with

lower working memory among teachers. Stress exhibits a significant negative relationship with working memory (β = -.128, SE = .015, t = 2.548, p = .011). Elevated stress levels are linked to decreased working memory capacity in teachers.

Discussion

The purpose of this study was to determine the relationship between depression, anxiety, and stress and job burnout with working memory in teachers of Zabol City, Iran. The result of this research shows that with the increase of stress, depression, anxiety and job burnout, the value of working memory decreases, which shows the inverse relationship between these variables. These findings are in line with other studies that indicate the relationship between these variables. In this regard, the results of Rastgo et al., (2017) research indicated that a group training program based on mindfulness has a significant effect in reducing the problems related to teacher burnout and some psychological problems such as stress, depression and anxiety, as well as increasing positive in the job satisfaction scores of teachers participating in these programs. Drawing from Maslow's hierarchy of needs, it is proposed that higher-order needs such as esteem and self-actualization are fulfilled through motivational factors, while lower-order needs such as physiological, safety, and belongingness are addressed through hygiene factors. Failure to satisfy these motivational needs may engender discontent and a diminished sense of commitment within the organization, fostering employee distrust towards their managers (depersonalization). Consequently, feelings of inefficacy and inadequacy emerge, leading to decreased individual performance and ultimately culminating in emotional exhaustion, symptomatic of burnout. Conversely, addressing both hygiene and motivational needs can engender heightened employee dedication and vigor, nurturing personal development and excellence among staff (Sepah Mansour et al., 2011).

Maslach (1981) posits that job burnout manifests as a decline in an individual's capacity to cope with stressors, without necessarily opposing them. When an individual struggles to manage mental stress in the workplace, it precipitates both physical and emotional exhaustion. This may lead to diminished self-perception, a negative job outlook, and a weakened connection with clients during working hours. Such an outcome is imperative to address. According to Baddeley (2003), there is common misconception wherein stress and burnout are equated, viewing them as interchangeable entities, as burnout represents the culmination of prolonged stress. Srivastava's (2017) study showed that extreme dependence on work can be a predictor of job stress and job anxiety and worries. In Hauk's (2013) study it was also found that stress can play an effective role in excessive dependence on one's work and one's occupational and family conflicts. Hakanen & Schaufeli (2012) delineated the response to mental pressure into three stages, emphasizing the initial stage. This comprises an appraisal of warning signs, followed by resistance, culminating in exhaustion. Thus, effective coping mechanisms, such as assuming personal accountability, in response to stressors, mitigate the likelihood of experiencing job burnout. Resorting to ineffective coping strategies, such as avoidance (characterized by passivity and acquiescence), elevates the risk of encountering job burnout (Karimi et al., 2013). The findings corroborate the findings of Bagheri Malekabadi & Doferi Ekbatan (2017), Mambani and Walipour Salmanvand (2014), and Suandi et al. (2014) which indicated a notable inverse correlation between job stress and job performance. According to Lupien and Lepage (2001), memory performance is impacted by acute stress conditions. If individuals perceive the magnitude of stress as high, it is anticipated that imposing cognitive load on memory will reduce its efficiency. Functional working memory is imperative for acquiring new information, as learning necessitates the manipulation, engagement, storage, and processing of data concurrently. Working memory plays a pivotal role in the learning process by facilitating the creation and adaptation of knowledge and encoding information for comprehension. Given that most learning and memorization processes traverse through working memory, its capacity and efficiency significantly impact the depth and breadth of learning. Rastgo et al. (2017) have elucidated a noteworthy correlation between the reduction of stress, anxiety, and job burnout, and the components of working and short-term memory.

The findings of this research not only have important implications for the mental health of teachers, but also have important implications for consequences such as health care costs, classroom atmosphere, motivation and academic progress of students. Among the limitations of the current research, we can mention sampling from one province, limitations in using communities with psychiatric disorders, limitations in access to subjects, and lack of screening examinations for psychiatric disorders. Overall, the result of this research shows that with the numerical increase of stress, depression, anxiety and job burnout, the value of working memory decreases, which indicates the inverse relationship between these variables.

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