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Research Paper: The Impact of Mindfulness Training on Occupational Stress and Quality of Life among Operating Room Personnel

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Abstract

Objective: This research demonstrates that the practice of mindfulness training led to a notable decrease in occupational stress and an improvement in the overall quality of life for professionals working in operating rooms.

Methods: The method of the present research was practical in nature and quasi-experimental in the form of pretest-posttest with a control group. The statistical population of this research included all operating room experts in Tehran hospitals. 50 people from this community were selected by convenience sampling method and were randomly divided into two experimental (25 people) and control (25 people) groups. Data was collected using standard questionnaires. T tests and ANCOVA were used to analyze data.

Results: The results showed that there is no significant difference in both occupational stress and quality of life in the pretest (both P>0.05). However, it was observed that experimental group had significantly lower occupational stress and higher quality of life compared to control group in the posttest (both P=0.001). Finally, the results of ANCOVA showed significant differences between experimental and control groups in both occupational stress and quality of life (both P=0.001).

Conclusion: These findings indicate that mindfulness can play a crucial role in managing work-related stress among operating room experts. Consequently, by actively participating in mindfulness activities, it is plausible to create more favorable circumstances for professionals working in operating rooms in terms of their quality of life.

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1. Introduction

During the past few decades, human societies have faced a fundamental issue that has become increasingly prevalent as societies transition towards a more modern lifestyle. This issue is none other than stress. With the advent of industrialization, stress has gained significant importance and has had a profound impact on the well-being of workers. The significance of stress in people's lives stems from its physical, mental, and social effects (Chaharbaghi et al., 2022; Afsanepurak et al., 2012; Dana & Shams, 2019; Dana et al., 2021). Moreover, stress affects all societies at various times and under different circumstances. Stress can be defined as any physical or psychological stimulus that disrupts an individual's ability to adapt and triggers counter reactions. Among the numerous sources of stress in an individual's life, their occupation stands out as one of the most significant. In fact, occupational stress has become a widespread and costly problem in the workplace, to the extent that the United Nations has labeled it as the disease of the 20th century. In essence, occupational stress arises as a response to the pressures emanating from the work environment, occurring when an individual's expectations surpass their capabilities and capacities.

Professions related to human health are particularly susceptible to high levels of stress, with medical centers being one of the most stressful work environments. According to a report by the American National Institute of Health, operating room specialists rank 27th out of 130 professions in seeking medical help for mental health issues. The stress factors in this line of work include personal reactions, personal concerns, work concerns, role fulfillment, and work concerns (Letvak et al., 2012; Mikkelsen et al., 2017; Newhan et al., 2014; Ohler et al., 2010). It is evident that the combination of these factors contributes to the high levels of stress experienced by operating room specialists. The impact of stress on doctors, nurses, and medical staff can lead to decreased performance and potential harm to both themselves and their patients. As well, it can directly affect their quality of life. Recent years have seen an increase in clinical trials focusing on cognitive-behavioral interventions to reduce stress, with mindfulness-based interventions being considered as part of the third wave of cognitive-behavioral therapies (Farsi et al. 2016; Ghorbani & Bund, 2014, 2017; Ghorbani et al., 2020; Khosravi et al., 2023; Moradi et al., 2020; Sadeghipor & Aghdam, 2021a).

Mindfulness is a type of meditation rooted in Eastern religious teachings and practices, particularly those of Buddha. Mindfulness involves focusing on specific, intentional ways in the present moment without judgment. The conscious mind must cultivate three qualities: non-judgment, intentional awareness, and present moment focus. By concentrating on the present moment, individuals can process various aspects of their immediate experiences, including cognitive, physiological, and behavioral activities. Through mindfulness exercises and techniques, individuals can become more aware of their daily activities, recognize the

automatic functioning of their minds in the past and future, and gain control over their thoughts, feelings, and physical states by being present in the moment (Sadeghipor et al., 2021a; Sadeghipor et al., 2021b; Seyedi-Asl et al., 2021; Seyedi-Asl et al., 2016; Taghva et al., 2020).

In the practice of mindfulness, individuals develop an awareness of their mental state in each moment. By recognizing the two modes of mind - doing and being - one can learn to transition between them, a process that involves training in behavioral strategies. Cognitive and metacognitive processes play a crucial role in focusing attention. As mindfulness increases, so does psychological well-being, openness, agreement, and a decrease in symptoms of pain (Faircloth, 2017; American Psychological Association, 2014; Conner & Davidson, 2003; Jolivet et al., 2010). Research indicates that individuals with higher intelligence are better equipped to recognize, manage, and solve everyday challenges. Mindfulness training, a method rooted in stress reduction and psychotherapy, teaches individuals to observe objects in life beyond their immediate control through breathing and contemplation (Ellis et al., 2013). This approach combines relaxation techniques with mindfulness practices. Studies have demonstrated that mindfulness aids in adjusting negative behavior patterns, controlling spontaneous thoughts, and promoting positive health-related behaviors. Stress reduction-based mindfulness training is considered one of the most effective methods, leading to reductions in stress, anxiety, and depression. Participants in this training are taught to observe their thoughts and emotions without judgment, reaction, or resistance (Sadeghpour & Sangchini, 2020; Taso et al., 2014; Bandura, 1997; Conner & Davidson, 2003; Hartfiel et al., 2011; Herrick et al., 2020; Chris et al., 2010).

Based on the provided information, it appears that professionals in the operating room face significant stress in their work, which undoubtedly has an impact on the quality of their performance and life. Given that this profession is known to be highly stressful, it is crucial to identify the factors that can alleviate occupational stress among operating room experts, which can consequently affect their quality of life. In this particular research, the focus was on whether mindfulness training for occupational stress could effectively reduce stress levels and quality of life in operating room experts. Consequently, the objective of this study was to investigate the effectiveness of mindfulness training on occupational stress and quality of life among operating room experts.

2. Methods

2.1. Research Design, Statistical Population, Sample, and Sampling Method

The method of the present research was practical in nature and quasi-experimental in the form of pretest-posttest with a control group. The statistical population of this research included all operating room experts in Tehran hospitals. 50 people from this community were selected by convenience sampling method and were randomly divided into two experimental (25 people) and control (25 people) groups. The inclusion

criteria for the study include: operating room experts who are not engaged in managerial work, not suffering from a severe psychiatric disease based on the individual's statements, not using psychiatric drugs based on the individual's statements, age above 22 years, not receiving any previous training programs and during the intervention of mindfulness, consent to participate in the research and the ability to attend weekly classes were in the intervention group.

2.2. Instruments

The Revised Nursing Stress Scale: In this research, the revised occupational stress scale was used to measure occupational stress. This scale is a revised version of the Occupational Stress Scale (Letvak et al., 2012). Occupational stress scale is the first tool that was created to measure the stress of nurses and operating room experts instead of general occupational stress. The thirty-four statements of this questionnaire measure the frequency and main sources of stress in the patient care situation. The scoring method of this questionnaire is in the form of a five-point Likert scale, and the subject must choose one of the following options according to the frequency of experience in the desired position. The answers are: 1=I am not stressed at all. 2= Sometimes I am stressed. 3= I am often stressed. 4= I am very stressed. 5= This position does not include my duties. In this research, Cronbach's alpha coefficient was 0.88 for this questionnaire.

The Quality-of-Life Scale: Reeves et al (2020) developed this scale which comprises 16 items categorized into five components: physical well-being (2 items), relationships (4 items), social activities (3 items), personal development and fulfillment (4 items), and recreational activities (3 items). These items are evaluated using a 7-point Likert scale, with a possible total score ranging from 16 to 112. A higher score indicates a higher quality of life. The scale's reliability was established through a Cronbach's alpha coefficient of 0.95.

After the members were selected and grouped, the questionnaire was administered as a pre-test in two groups. Mindfulness group training sessions were organized for the experimental group. Finally, after the training for the second time, the questionnaire was administered by two experimental and control groups as a post-test. The training was conducted in 8 sessions of 90 minutes, twice a week and during a period of 4 weeks (Table 1).

Table 1

Summary of mindfulness training sessions

First session	The process involves familiarizing oneself with the group members, administering a preliminary assessment, establishing a comprehensive policy that respects the privacy and personal lives of individuals. Additionally, participants are encouraged to introduce themselves, engage in mindful eating exercises with raisins, complete assigned tasks such as undergoing a physical check-up, dedicating 45 minutes to a thorough physical examination, and mindfully performing routine daily activities like washing, eating, and brushing teeth. Furthermore, there are additional activities that will be disclosed later.
Second session	Examining the assignments from the last class, engaging with thoughts and emotions, and completing homework tasks (such as documenting positive experiences).
Third session	Reviewing homework from the previous session, engaging in a 30 to 40-minute sitting meditation, practicing mindful walking as part of the assigned homework, completing the three-minute breathing space exercise three times daily, and registering unpleasant events as additional homework.
Forth session	Reviewing the homework from the last session, engaging in a meditation involving both seeing and hearing, practicing sitting meditation, completing the assigned sitting meditation practice, and finishing the 3-minute breathing space exercise.
Firth session	Instructing individuals on the importance of logically assessing life occurrences while highlighting the significance of personal accountability, acknowledging one's role in each situation. Engaging in seated meditation, completing assigned meditation exercises.
Sixth session	Visualization sitting meditation, homework (shorter guided meditations of at least 40 minutes), practice ambiguous scenarios, homework (three-minute breathing 3 times per day).
Seventh session	Engaging in meditation while seated, completing assigned tasks independently, identifying the correlation between mood and actions, practicing deep breathing exercises for three minutes thrice daily, and during moments of stress or intense emotions. Conversations regarding symptoms of relapse and creating a plan for managing potential setbacks.
Eighth session	Physical examination, homework, reflection, feedback, end of meetings and post-examination, summation and conclusion with the help of members.

Descriptive statistics including frequency, mean and standard deviation were used to analyze the data, and inferential statistics tests (Kolmogorov-Smirnov test, paired-sample t test, independent t test and univariate analysis of covariance test) were used to analyze the data. P value was set at $P < 0.05$.

3. Results

Table 2 displays the average and standard deviation of the personal attributes of the participants, such as age, height, weight, and body mass index (BMI).

Table 2

Demographic features of the participants

Indicator	Group	No.	mean±SD	P
Age (year)	Control	25	29.11±3.94	0.64
	Training	25	28.97±5.27	
Height (M)	Control	25	1.65±0.05	0.72
	Training	25	1.66±0.04	
Weight (Kg)	Control	25	70.90±4.07	0.69
	Training	25	69.84±6.31	
Body mass index (Kg/M^2)	Control	25	24.07±1.09	0.59
	Training	25	24.33±1.26	

The results of the paired-sample t-test (Table 3) revealed a notable influence of the aerobic training regimen on occupational stress (P=0.001) and quality of life (P=0.001) among the individuals in the training group from the initial assessment to the final assessment. Conversely, there were no significant differences in the impact observed between the pre- and post-tests in the control group for both occupational stress and quality of life.

Table 3

Paired-Sample t test results for intra-group comparison of occupational stress and quality of life

	Control Group				Training Group			
	Pretest	Posttest	T	P	Pretest	Posttest	t	P
Occupational stress	139.84±14.27	138.46±12.09	0.109	0.84	141.28±15.33	115.07±9.21	10.11	0.001
Quality of life	59.17±12.35	60.34±11.64	0.137	0.58	61.40±19.64	79.84±16.54	15.94	0.001

Table 4 presents the findings of the covariance test analysis conducted to compare the two groups. According to Table 4 and the level of significance is 0.0001, which is less than 0.05, there is a significant difference between the estimated mean occupational stress scores of experimental and control subjects, and the amount of difference indicates that 68.21% of the variance of the post-test scores is due to the effect of mindfulness training on occupational stress. Therefore, mindfulness training is effective on the occupational stress of the operating room experts, and according to the averages, it has reduced the amount of occupational stress.

Table 4

Analysis of covariance test outcomes for inter-group evaluation of occupational stress

	Sum of squares	Df	Mean of squares	F	P	Eta squared
Pretest	3028.115	1	3028.115	30.151	0.001	50.61
Group	28471.039	1	28471.039	250.614	0.001	68.61
Error	2754.239	47	102.964			

Table 5 presents the findings of the covariance test analysis conducted to compare the two groups. According to Table 5 and the level of significance is 0.0001, which is less than 0.05, there is a significant difference between the estimated mean quality of life scores of experimental and control subjects, and the amount of difference indicates that 73.08% of the variance of the post-test scores is due to the effect of mindfulness training on quality of life. Therefore, mindfulness training is effective on the quality of life of the operating room experts, and according to the averages, it has increased the amount of quality of life.

Table 5

Analysis of covariance test outcomes for inter-group evaluation of quality of life

	Sum of squares	Df	Mean of squares	F	P	Eta squared
Pretest	2934.614	1	2934.614	30.151	0.001	50.61
Group	27115.151	1	27115.151	250.614	0.001	68.61
Error	2471.006	47	97.394			

The Independent t test results indicated a notable difference in the post-test results between the control and training groups (P=0.001). More precisely, the training group exhibited a significant improvement in occupational stress and quality of life in comparison to the control group.

Table 6

Results of Independent t test to investigate the difference inter-groups in occupational stress and quality of life

	Test stage	t	P
Occupational stress	Posttest	10.84	0.001
Quality of life	Posttest	12.05	0.001

4. Discussion

The current investigation aimed to assess the impact of mindfulness training on the occupational stress and quality of life of operating room professionals. The research intervention involved mindfulness training,

and the findings indicated a significant reduction in occupational stress among operating room experts. These results are consistent with previous research outcomes in this area. In this study's findings, it is evident that occupational stress poses a significant health risk within organizations, diminishing the potential of human resources and subsequently impacting the organization's efficiency, effectiveness, and overall performance (Khosravi et al., 2023; Moradi et al., 2020; Sadeghipor & Aghdam, 2021; Sadeghipor et al, 2021a). The statistical population of this research, being one of the key sectors, faces a critical situation due to exposure to occupational stress, resulting in a decline in organizational performance. Healthy and skilled human resources are crucial for the success of any organization. Prolonged stress and frustration, particularly among employees lacking emotional support, can lead to chronic occupational stress. Psychologists are now focusing on enhancing job adaptability by recognizing job-related stress and evaluating employees' psychological traits. As mentioned, job stress can have detrimental effects on biological functions, affecting employees both psychologically and socially. These complications can disrupt various aspects of professional, personal, and social life, impacting interpersonal relationships (Sadeghipor et al., 2021b; Seyedi-Asl et al., 2021; Seyedi-Asl et al., 2016; Taghva et al., 2020). Therefore, it is essential to identify and address occupational stress in industrial and medical settings, providing psychological interventions to enhance mental well-being and satisfaction, ultimately fostering a conducive environment for workforce productivity.

On the contrary, it is crucial to prioritize enhancing the efficiency of occupational and organizational factors, while also taking measures to identify and prevent the detrimental effects of occupational stress. To effectively manage the mind, it is essential to have a correct understanding of the principles governing the mind and utilize its full potential through proper management. Mindfulness serves as a powerful tool for unlocking the mind's maximum potential and effectively managing it (Bandura, 1997; Conner & Davidson, 2003; Hartfiel et al., 2011; Herrick et al., 2020). By arousing physiological responses and enabling the observation of internal and external stimuli without judgment or bias, mindfulness promotes heightened awareness of the present moment. Consequently, individuals become less fixated on the past or future, as they develop a greater sense of presence. Many psychological issues often stem from past events or future concerns. Therefore, by enhancing the capacity and capabilities of the information processing system, mindfulness can serve as an effective strategy in reducing tendencies towards worrisome responses and unpleasant emotions (Dana et al., 2021; Ghorbani & Bund, 2014).

In addition, the study's findings indicated that individuals in the operating room who were experiencing work pressure and stress saw a decrease in their occupational stress levels after undergoing 8 sessions of mindfulness training, compared to the control group. Employees may also experience a decline in personal success if they feel that

their emotional expressions are ineffective; however, mindfulness training can help individuals understand their personalities and develop effective strategies (Masten, 2001; Sadeghipor & Aghdam, 2021). By doing so, they can move away from feelings of inefficiency and towards more optimistic conditions. Achieving mindfulness is not a simple task, as it involves metacognitive learning and adopting new behavioral strategies to enhance focus, prevent rumination, and reduce worrisome responses. Ultimately, mindfulness training leads to the generation of new thoughts and the alleviation of negative emotions (Conner & Davidson, 2003; Jolivet et al., 2010).

Furthermore, the findings indicate that mindfulness training has a significant impact on enhancing the overall quality of life. These research results align with previous studies conducted in this field. Based on these findings, it can be concluded that self-care training centered around mindfulness enhances the psychological aspect of one's quality of life. By practicing mindfulness, individuals are better equipped to handle life's challenges in a rational and optimistic manner, fostering a positive mindset towards various life events. Ultimately, this positive outlook has a beneficial influence on individuals' mental state.

5. Conclusion

This research demonstrates that the practice of mindfulness training led to a notable decrease in occupational stress and an improvement in the overall quality of life for professionals working in operating rooms. These findings indicate that mindfulness can play a crucial role in managing work-related stress among operating room experts. Consequently, by actively participating in mindfulness activities, it is plausible to create more favorable circumstances for professionals working in operating rooms in terms of their quality of life. The practical implications of our findings are relevant to healthcare institutions, as it is recommended that they promote and support the involvement of operating room experts in mindfulness practices to enhance their well-being.

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Conflict of interest

The authors declare that there is no conflict of interest with any organization. Also, this research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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Research Paper: Investigating the Relationship between Screen Time and Green Time with Academic Engagement and Academic Performance

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Abstract

Objective: This study investigated the relationship between screen time and green time with academic engagement and academic performance of secondary school students in Tabriz city.

Methods: The present study was part of cross-sectional and descriptive studies of the correlation and prediction type. Three hundred eighty-five people from Tabriz secondary school students were selected in the first semester of the 2022-2023 academic year by multi-stage cluster sampling based on Morgan's table. All sample members completed Reeve's academic engagement scale (AES) and Screen Time Questionnaire (STQ). The student's GPA was considered their academic performance and was evaluated by adding two questions to the research questionnaires of the green time variable. The collected data were analyzed using Pearson's correlation coefficient, simultaneous regression, and SPSS[23] statistical software.

Results: The results showed a negative and significant relationship between screen times, the dimensions of academic engagement, and the student's GPA. It was also found that there is a positive and significant relationship between green time and the dimensions of academic engagement (except the emotional involvement dimension) and students' GPA. Screen time and green time significantly contributed to explaining students' academic engagement and academic performance.

Conclusion: The results highlighted the importance of screen and green time in educational variables.

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1. Introduction

Education is one of the most important necessities of life. Without education, the continuation of life is at risk since schooling requires a lot of money and a large budget, so students' academic education aims to increase their academic performance. Governments allocate vast sums of national income to education, and families bear many expenses for their children's education. Increasing academic performance means academic success. Academic success means how successful the learners have been in reaching the goals of the educational course (Seyf, 2013; Bonilla-Rius, 2020). Another critical component in the field of education is academic engagement. During the past decade, researchers have shown increasing interest in academic engagement to increase student participation in school-related activities, foster success, and understand positive student development (Upadyaya & Salmela-Aro, 2013; Carter et al., 2012; Li & Lerner, 2011; Salmela-Aro et al., 2021). Research has shown that the more students are involved in academic issues and learning tasks, the more academic success they achieve (Saber & Sharifi, 2013). *Academic* engagement is a structure proposed for the first time to understand and explain academic failure and was considered the basis for reformist efforts in education (Schlechty, 2005). Various definitions of academic engagement have been provided. Some believe that the learner is involved in academic tasks only when the functions in question require problem-solving and high-level thinking skills such as evaluation critical and creative thinking (Schlechty, 2005). By definition, it can be said that learners are not involved in learning, but they are involved in assignments and activities that lead to learning (Alhazmi & Rahman, 2014). Alhazmi and Rahman (2014) believe that in virtual social networks, academic engagement refers to the time and effort students spend in educational activities inside and outside the classroom.

One of the factors that has been determined to play a role in students' academic performance is *screen time* (Kumar & Shirley, 2020; Muppalla et al., 2023). Definitions of *screen time* vary, which raises numerous issues of coordination, measurement, and comparison. The Oxford English Dictionary (2020, p.251) defines *screen time* as "time spent using a device such as a computer, television or games console," while the latest World Health Organization (2019) guidelines focus on the issue of screen time. Moreover, it is "time spent passively watching screen-based entertainment (TV, computer, mobile devices). Sedentary behaviors, defined as sitting or lying activities, include energy expenditure from 0.1 to 1.5 of the basal metabolic equivalent (Pate & Lobelo, 2008). They considered it the fourth major risk factor for mortality worldwide (World Health Organization, 2010). Media use is the most prevalent leisure-time sedentary behavior among children and adolescents. Screen media use includes screen-based activities such as surfing the Internet, using a computer or cell phone, watching television, and playing video games (Marshall et al., 2006). On average, children and adolescents watch TV between 1.8 and 2.8 hours in their free

time, play video games for 40 minutes, and use computers for 34 minutes a day (Marshall et al., 2006). Overall, 28% of children and adolescents are involved in these screen-based activities for more than 4 hours daily, with a higher prevalence in boys than girls (30% vs. 25%) (Marshall et al., 2006).

The results of studies in the field of the relationship between show time and educational variables are controversial. The results of some studies indicate a negative relationship between screen time and academic performance (Paulich et al., 2021; Howie et al., 2020; Adelantado-Renau et al., 2019; Kanburoglu et al., 2014; Peiro´-Velert et al., 2014). Some studies have not found a significant relationship between show time and academic performance (Kumar & Shirley, 2020; Sinnarajah et al., 2019; Tarekegn & Endris, 2019). Sanders et al. (2019) have partially clarified this debate by distinguishing between active and passive components of screen time. They concluded that inactive screen time (e.g., television) was associated with worse outcomes, educational screen time (e.g., computers for homework) was related to positive academic outcomes, and had no negative relationship with other outcomes.

By reviewing several articles, Oswald et al. (2020) examined the effect of show time and green time on many variables of the studied samples at different levels of education, including academic progress. They found the effect of screen time negative and the impact of green time positive. They were evaluated positively. *Green time* is generally defined as the time spent in the environment, elements with natural content, or exposure to it. Improving the availability, accessibility, and quality of green space will likely positively impact adolescents' mental well-being (Zhang et al., 2020). Browning and Rigolon (2019) concluded in a review article that 28% of studies support the positive effect of green space, and 8% support its negative impact on academic achievement and performance. However, they ultimately needed more research on this issue. Moreover, they proclaimed different results in this field. The results of the study by Tuen Veronica Leung et al. (2019) indicated the positive effect of green time on the academic performance of English students.

Despite the increasing research that is done in the field of show time and green time and their relationship with educational variables outside of Iran, unfortunately, Iranian researchers have not yet investigated these variables; apart from the few investigations that have been carried out, one of the social problems is that the research background in this field is minimal. On the other hand, the results of the studies conducted by researchers in this field need to be more consistent and are controversial. Therefore, the present study investigates the relationship between show and green time on academic engagement and performance. This study examined the relationship between screen time and green time with academic engagement and academic performance of secondary school students in Tabriz city.

2. Methods

2.1. Research Design, Statistical Population, Sample, and Sampling Method

The current study is a cross-sectional descriptive study of a correlation and prediction type. Population, sample, and sampling method: The population of the present study includes all the male and female secondary school students of Tabriz, approximately 8000 people, who were studying when distributing the questionnaires. Three hundred eighty-five people from Tabriz secondary school students were selected in the first semester of the 2022-2023 academic year by multi-stage cluster sampling based on Morgan's Table.

2.2. Instruments

Reeve Academic Engagement Scale (AES): Academic Engagement Questionnaire was designed and compiled by Reeve (2013) to measure academic engagement. This questionnaire has 17 questions and 4 components of behavioral, agent, cognitive, and emotional involvement, measuring academic involvement based on the seven-point Likert scale. Each question has 7 points: 7 points for strongly agree and 1 point for strongly disagree. The questionnaire does not have a reverse score. By adding the score of each question, the score of each dimension is obtained, and the sum of the scores of all items is the total score of academic engagement. In this questionnaire, eight items were used to measure the dimension of cognitive engagement, four items were used to measure the dimension of emotional engagement, five were used to measure the dimension of behavioral engagement, and five were used to measure the dimension of affective engagement. Reeve (2013) reported Cronbach's alpha coefficient of 0.82 and 0.88, 0.75, and 0.86, respectively, for cognitive, behavioral, and functional aspects of the academic engagement questionnaire, indicating the reasonable validity of the questionnaire. Saber and Sharifi (2013) evaluated the validity of this questionnaire's content, form, and criteria. For this questionnaire, Cronbach's alpha coefficient calculated in Saber & Sharifi's research (2013) was estimated to be above 0.70.

Academic performance: The grade point average at the end of the academic year was used to evaluate the student's academic performance. For this purpose, the image of the semester report card and the recorded GPA at the end of the semester were viewed and entered as the academic performance score.

Screen Time Questionnaire (STQ): This questionnaire was created by Vizcaino et al. (2019). The questionnaire has 18 questions designed to check the exposure of the examined subjects to television, devices related to television (such as game consoles), laptops/computers, smartphones, and tablets. The exact time spent using each item mentioned above will be recorded by noting the hours and minutes on an average weekday, weeknight, weekend day, and regular weekday. Based on the study of Vizcaino et al. (2019) about the reliability of the questionnaire that asks about the use of television, laptop/computer, smartphone, and

tablet during one day of the week and three questions related to the use of the screen, showing good to excellent reliability (ICCs = 0.61-0.90). Questions that probed screen use during a weeknight showed moderately high reliability (ICCs = 0.50–0.82). Questions about screen use during a weekend day showed excellent reliability (ICCs = 0.84-0.87), except for smartphone use (ICC = 0.16), reliability results for all screen types were good in different study periods. However, the measurement error was lower among items that inquired about TV, laptop/computer, smartphone, and tablet use during a weeknight program. Among the different screen types, devices connected to TV and laptop/computer use during the week and weeknight had the highest accuracy, while smartphone use during the weekend day showed the highest measurement error. In the current study, the internal validity of the questionnaire was checked, and Cronbach's alpha coefficient of the questionnaire was 0.78.

Green time: Based on what is customary in valid studies outside of Iran (for example, Camerini et al, 2021) and to evaluate green time some questions were added to the end of the screening time questionnaire by the researcher. In this questionnaire, the amount of time the subject spent in urban green spaces, including parks, forest parks, green spaces at the place of residence, and green spaces at the place of study, by mentioning hours and minutes on an average weekday, on an average weeknight, recorded on a weekend day and regular weekdays.

2.3. Implementation method

The present study was conducted in the school environment and on students. Research questionnaires were administered individually. Questionnaires were provided to the students by the researcher and his colleagues in the school environment and collected after their responses. Necessary permissions to implement the questionnaires were obtained from the university's academic vice-chancellor. After determining the target sample and with the help of several colleagues, the research questionnaires were examined at the disposal of the sample. They were collected immediately after the completion of the responses. After collecting data through the implementation of questionnaires, the raw data were described through the descriptive statistics of mean and standard deviation. After performing the statistical tests to determine the normality of the investigated data, Pearson's correlation coefficient and simultaneous regression statistical tests were used to check the hypotheses.

3. Results

First, the descriptive indices of the examined variables are displayed in Table. 1 through average, standard deviation, skewness, and Kurtosis statistics to check the normality of the data distribution. It should be noted that two indices of skewness and kurtosis were used to evaluate the normality of the data. According to Table. 1, the skewness values of the data are in the range of ±2, and the values of Kurtosis are in the range of ±3, indicating that the distribution of the research data is normal.

Table 1

Descriptive indices of research variables

Indicators Variables	Mean	standard of deviation	skewness	Kurtosis
Behavioral involvement	22.31	5.31	-1.055	0.082
Practical involvement	21.37	5.63	-0.774	0.703
Cognitive involvement	22.12	5.11	-0.671	-0.780
emotional involvement	23.26	6.64	-0.571	-0.497
green time	10.26	6.99	0.444	-0.128
screen time	17.37	17.92	1.11	1.30
GPA	18.30	1.45	1.11	-0.568

Pearson's correlation coefficient was used to check the relationship between the predictor variables and the criterion, and the results of the correlation matrix between the variables are shown in Table 2.

Table 2

Correlation matrix of research variables

Variables	1	2	3	4	5	6	7
Behavioral involvement	1						
Practical involvement	0.752**	1					
Cognitive involvement	0.756**	0.693**	1				
emotional involvement	0.694**	0.670**	0.648**	1			
green time	0.284**	0.387**	0.353**	0.155	1		
screen time	-0.371**	-0.307**	-0.340**	-0.206*	-0.368**	1	
GPA	0.694**	0.565**	0.613**	0.503**	0.225*	-0.373**	1

P≤0.01** P≤0.05*

Based on the results of Table 2, it was found that there was a negative and significant relationship between screen time, the dimensions of academic engagement, and the GPA of the students. It was also found that there was a positive and significant relationship between green time and the dimensions of academic engagement (except the emotional involvement dimension) and students' GPA.

Simultaneous regression was used to determine the contribution of each predictor

variable in predicting the criterion variables, the results of which are presented in Table 3.

Table 3

Summary of multiple regression model for predicting criterion variables through predictor variables

Variables		B	SE	Beta	R^2	Sig
Anticipate	criterion	0.130	0.072	0.171	0.163	0.07
green time	Behavioral	-0.091	0.028	-0.308		0.001
screen time	involvement	0.178	0.069	0.242	0.167	0.01
green time	Cognitive	-0.071	0.027	-0.251		0.009
screen time	involvement	0.087	0.095	0.092	0.050	0.36
green time	emotional	-0.64	0.037	-0.172		0.089
screen time	involvement	0.256	0.075	0.317	0.181	0.001
green time	Practical	-0.060	0.029	-0.190		0.04
screen time	involvement	0.021	0.020	0.101	0.148	0.28
green time	GPA	-0.027	0.008	-0.336		0.001
green time		0.130	0.072	0.171	0.163	0.07

According to the results of Table 3, the predictor variables can explain 16.3 percent of the changes in the behavioral involvement variable. Table 3 showed that screen time with a beta value of 0.30 was decisive in the regression model. According to the results of Table 3, predictor variables can explain 16.7 percent of the changes in the variable of cognitive involvement. Table 3 revealed that screen time with a beta value of 0.25 and green time with a beta value of 0.24 played a role in the regression model. We concluded that green time and screen time did not play a role in explaining emotional involvement. According to the results of Table 3, the predictor variables can explain 18.1% of the changes in the practical conflict variable. Table 3 indicated that screen time with a beta value of 0.19 and green time with a beta value of 0.31 played a role in the regression model. The predictor variables can explain 14% of the changes in the educational variable (Table 3). Based on Table 3, screen time with a beta value of 0.33 played a role in the regression model, and green time did not explain this model.

4. Discussion

This study investigated the relationship between screen time and green time with academic engagement and performance in students. Based on the results obtained, it was found that there was a negative and significant relationship between screen time, the dimensions of academic engagement, and the grade point average of the students. It was also found that there was a positive and significant relationship between green time and the dimensions of academic engagement (except for the emotional involvement dimension) and students' GPA. The results obtained in the present study are in line with

most of the findings in this field (Paulich et al., 2021; Howie et al., 2020; Adelantado-Renau et al., 2019; Kanburoglu et al., 2014; Peiro´-Velert et al., 2014). First, we examine the results of studies that scrutinized the relationship between screen time and academic engagement. In explaining these findings, it is necessary to mention several important points. First, exposure to the screen and showing more screen time mean losing time related to other things in life, including studies and academic activities. As mentioned, media use is the most prevalent leisure-time sedentary behavior among children and adolescents.

Screen media includes screen-based activities such as surfing the Internet, using a computer or mobile phone, watching television, and playing video games (Marshall et al., 2005). On average, children and adolescents watch TV between 1.8 and 2.8 hours in their free time, play video games for 40 minutes, and use computers for 34 minutes a day (Marshall et al., 2005). Overall, 28% of children and adolescents are engaged in these screen-based activities for more than 4 hours a day, the prevalence of which is higher in boys than in girls (30% vs. 25%) (Marshall et al., 2005). Getting involved in the screen can take away time that would be helpful for students' academic engagement. Next, it is expected to engage in screen time for non-academic activities. The latest guidelines of the World Health Organization (2020) focus on the issue of screen time and define it as "time spent watching screen-based entertainment (TV, computer, mobile). In this definition, devices do not include active screen-based games that require physical activity or movement. If the time spent with the screen requires involvement in entertainment and non-academic affairs, and if the participation in the screen is related to academic affairs, such results may not be obtained.

Another important thing is that screen time is not just a time of the student's interaction with the screen; it is dependent on and related to the same specific time. The fact is that other students' time will also be affected by the show time, and usually, students need help managing the time between the show time and the time to deal with academic affairs. Another thing is that screen time is more related to negative variables, which can ultimately reduce students' academic involvement to its minimum. Many studies have reported a positive relationship between screen time and depression (e.g., Stiglic & Viner, 2019; Madhav et al., 2015), which in turn could be due to poor sleep quality caused by screen time. Inactivity and lack of activity are caused by screen time and the inability to face the stress of life, and these factors can, in turn, cause problems in the level and quality of academic engagement of students.

Based on the obtained results, it was found that there was a negative and significant relationship between screen time and the GPA of the students. The results obtained in the present study were consistent with some of the findings in this field. For example, Paulich et al. (2021), in a study that was partially dedicated to examining the relationship between screen time and academic performance, concluded that an increase in screen time was associated with a

decrease in academic performance. Howie et al. (2020), in a study on Australian students, part of which examined the relationship between screen time behavioral guidelines and academic performance, concluded that compliance with screen time guidelines and higher academic performance and better scores in language and math were associated. Sedentary behaviors during screen time were associated with lower academic performance. Kanburoglu et al. (2014) conducted a study to reach the optimal display time concerning academic progress. They concluded that increased television viewing is associated with more significant declines in academic achievement. The academic progress of students who spent less than an hour of their daily time on the computer and who went to the cinema at least once a month was higher. Peiro´-Velert et al. (2014), in the study entitled "Screen media use, sleep time and academic performance in adolescents: clustering analysis of self-organizing maps", concluded that adolescents with higher academic performance spend less time on screens. They were inactive. It was also found that teenagers who spent more than 5.5 hours on TV had a lower academic performance.

Moreover, the results obtained in the present study were different from some of the findings in this field. For example, Kumar, Shirley (2020), in a study that aimed to investigate the relationship between the duration of the show and the academic performance of Indian students, stated that there was no statistically significant relationship between the duration of the show and the combined academic performance and the academic performance in mathematics, science and language do not exist. Sinnarajah et al. (2019), in a study conducted to investigate the relationship between screen time and students' academic performance, concluded that there was no significant relationship between screen time and students' academic performance. Tarekegn and Endris (2019) investigated the relationship between the amount of television viewing as one of the examples of screen time and academic progress. They concluded that there was no significant relationship between the hours of television viewing and the academic progress of students. Based on this, they concluded that television itself may not have a significant effect on students' academic achievement. Adelantado-Renau et al. (2019) examined the relationship between screen time and academic performance among children and adolescents and concluded that overall screen time was not related to academic performance. However, time spent watching television was negatively associated with academic performance, language learning and mathematics. In the analysis of subgroups, it was found that only in children watching TV, it was inversely related to language learning, and only in teenagers watching TV and video games it was related to composite scores.

This disparity of results can have many reasons which can be effective among the methodological differences of various studies conducted in this field. In different studies that are carried out in diverse populations, different tools are used to measure variables. This disparity in the present study, which

could be more noticeable, can be the basis of other studies in this field.

In explaining the negative relationship between screen time and academic performance in the present study, it is necessary to mention some crucial points. As for academic engagement, the first thing is that being exposed to the screen and having more screen time means losing time related to other things in life, including education. In particular, media use is the most prevalent leisure-time sedentary behavior among children and adolescents. Using screen media includes screen-based activities such as surfing the Internet, using a computer or mobile phone, watching television, and playing video games (Marshall et al., 2006). On average, children and adolescents watch TV between 1.8 and 2.8 hours in their free time, play video games for 40 minutes and use computers for 34 minutes a day (Marshall et al., 2006). Overall, 28% of children and adolescents are engaged in these screen-based activities for more than 4 hours a day, the prevalence of which is higher in boys than in girls (30% vs. 25%) (Marshall et al., 2006). Getting involved in the screen can take away time that would be helpful for students' academic engagement. The next is that it is expected to engage in screen time for non-academic activities. The latest guidelines of the World Health Organization (2019) focus on the issue of screen time and define it as "time spent watching screen-based entertainment (TV, computer, mobile, p.58)". In this definition, devices do not include active screen-based games that require physical activity or movement. If the time spent with the screen requires involvement in entertainment and non-academic affairs, and if the involvement with the screen is related to academic affairs, such results may not be obtained.

Another important thing is that screen time is not just a time of the student's interaction with the screen; it is dependent and related to the same specific time. The fact is that other students' time will also be affected by screen time, and students usually need help managing the time between screen time and the time to deal with academic affairs. Another thing is that screen time is more related to negative variables, ultimately reducing students' academic performance. Many studies have reported a positive relationship between screen time and depression (e.g., Stiglic & Viner, 2019; Madhav et al., 2015), which in turn could be due to poor sleep quality caused by screen time. Inactivity and lack of activity caused by screen time and the inability to face the stress of life caused by screen time factors can, in turn, cause problems in the academic performance of students and its quality.

Based on the obtained results, it was found that there was a positive and significant relationship between green time and the dimensions of academic engagement (except for emotional involvement) and students' GPA. This finding is in line with the findings of this field. For example, Oswald et al. (2020), in a review of the studies conducted about the effects of screen time and green time on various variables, as a part of their results reported that the effects of screen time on academic performance are adverse. Moreover, the effects of green time on academic performance are positive.

Browning and Rigolon (2019) concluded that 28% of studies support the positive effect of green space, and 8% support the negative effect of green space on academic achievement and performance. However, they ultimately needed more research on this issue.

Moreover, they announced different results in this field. The results of the study by Tuen Veronica Leung et al. (2019) indicated the positive effect of green time on the academic performance of English students. The results of the study by Tuen Veronica Leung et al. (2019) under the title "What is the Relationship between Green Spaces and Students' Academic Performance in English and Mathematics?" indicated the positive effect of green time on the academic performance of English-speaking students.

Green time is generally defined as time spent in or exposed to natural environments, elements, or content. A person can study in the green space, and in general, the choice of green space, which is considered part of a person's green time, can be for curricular and non-curricular studies. In addition, the presence of green spaces in educational environments plays a role in improving students' academic performance and student engagement. Tuen Veronica Leung et al. (2019) stated that more greenery in the environment contributes to better academic performance in English and mathematics in students of all grades. This finding can be used as a reference for making changes in the school environment and green landscape design, especially in the vicinity of school areas. This finding can be used as a reference for making changes in the school environment and green landscape design, especially in the vicinity of school areas. Therefore, another positive effect of green space on academic performance and involvement is due to the nature of green space and its positive effects on the body and mind of people there.

Another thing is that green spaces are usually used as a space for rest and renewal of physical and mental strength after daily and academic affairs. By creating environmental diversity and freshness, these spaces can renew physical forces and relieve physical and mental fatigue caused by academic performance. Studies have reported that green time is associated with favorable psychological outcomes (Oswald et al., 2020). The favorable psychological consequences provide a reasonable basis for more academic engagement and better academic performance. Academic engagement and optimal academic performance require the right atmosphere, environment, and mental health. During the green time, the student can study in favorable weather conditions and with a favorable mindset, and the desired academic performance can be predicted for her/ his.

5. Conclusion

The present study's findings highlighted the importance of screen time and green time in explaining students' academic engagement and academic performance.

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Conflicts of Interest

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Research Paper: Effectiveness of Cognitive Behaviour Therapy in Reducing Bullying Behaviours of Adolescents in Taraba State, Nigeria

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Abstract

Objective: This study examined the effectiveness of cognitive behaviour therapy (CBT) in reducing bullying behaviours among adolescents in Taraba State, Nigeria.

Methods: This study adopted a quasi-experimental design. The population of this study was 3,222 SS1 students of the 2022/2023 Academic Session and a sample of 24 adolescents were drawn as subjects of the study using purposive sampling. The researchers used a questionnaire titled Adolescents' Behavioural Problem Questionnaire (ABPQ) for data collection. The data collected were analyzed using paired samples and independent samples t-test to analyze the hypotheses.

Results: The findings revealed that CBT was effective in reducing bullying behaviours among adolescents. The findings also revealed that there was gender difference in the effectiveness of CBT in reducing bullying behaviours among adolescents.

Conclusion: The researchers concluded that CBT is effective in ameliorating bullying behaviours among adolescent students.

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1. Introduction

Adolescence is a period that is characterized by major transformations in the lives of young people. At this stage, the changes occur physically, mentally and socially. These changes are manifest through their abilities to form interpersonal relationships. Musa and Sababa (2013) assert that adolescence is a period filled with new experiences, new responsibilities and new relationship between adults and the young people themselves. This period comes with its dangers, stress, frustration, anxiety and several deviant or behavioral problems. In some cases, these challenges may lead to maladaptive behaviours, poor academic performance, and even mental health problems. While some individuals deal with the challenges of adolescence successfully, many however, develop difficulties that can have enduring consequences for their later functioning and well-being (Huesmann et al., 2009). These difficulties may appear in different forms through strained inter-personal relationships, social anxiety, aggressive and violent behaviours such as bullying.

Olweus and Limber as cited in Mbadugha et al. (2019) described bullying behaviour as being subjected to unfavorable acts by one or more other students on a regular basis over an extended period of time. Attempting or purposefully causing harm or suffering to others is one example of such harmful behaviour. The harm or discomfort can be inflicted physically (such as by hitting, kicking, pushing, or choking) or verbally (such as by calling names, threatening, taunting, malicious teasing, or spreading nasty rumors). It can also show up in other ways, like making faces or obscene gestures, or by purposefully being left out of a group. While behaviours that indicate very blatant attacks (typically verbal or physical) on the victim are included in the category of "direct bullying," the latter, usually subtler forms, are referred to as "indirect bullying." The researchers of this paper see bullying as a conscious, deliberate and aggressive behaviour that is repeatedly targeted at individuals who are seen as weak and cannot stand for themselves through verbal insults and physical violence.

Even though scholars have found that bullying occurs in different social settings other than schools, its prevalence in the school environment exerts greater magnitude. However, there is contradiction as to the level of prevalence of this behavioural problem in Nigeria. some researchers report high prevalence while others report low prevalence. Scholars like Fenny and Falola (2020) while investigating bullying behaviours among secondary school students, assert that the prevalence of bullying is 59.9%. Another survey conducted by Ighaede-Edwards et al. (2023) reports that 27.9% of students were bullies while 51.9% of students have experienced at least one type of bullying. Egbochuku (2007) found out that 78% of students in Nigerian schools have been victims of bullying while 71% were perpetrators of bullying behaviours. Based on these findings by previous scholars, it seems fair to draw a conclusion that bullying behaviours at schools are recognized as dangerous and harmful acts that victimize the

targeted students and bystanders. This behaviour has therefore, become a thing of concern to teachers, school management and the major educational stakeholders. There is need for an adequate intervention or strategy which calls for combatting and reducing such behaviours.

Studies have been conducted on various issues and topics; however, conclusion has not been reached on whether or not gender has any influence. Global studies on bullying behaviors among male and female students reported interesting findings. Scholars report that the level of being bullied and exhibiting bullying behaviour is higher among males than the females (Asiyai, 2015; Azid, 2022; Fenny & Falola, 2020; Umoke et al., 2020). In the same vein, Asiyai (2015) pointed out that bullying often occurred in boarding schools than day schools. Other scholars assert that female students exhibited higher bullying behaviours than their male counterparts. These studies also believe that the female students are more likely to be victims of bullying than the male students (Carbone-López et al., 2010; Olubunmi, 2015).

Literature reviews on bullying and psychosocial problems have reported the effectiveness of counselling/psychological interventions in ameliorating these behavioural problems. Some of these studies which were conducted by Asro et al. (2021) and Santy & Machmuda (2019) revealed that group counselling was effective in helping adolescents reduce bullying behaviours. Similarly, a study conducted by Efastri et al. (2015) reported the significant effectiveness of a behavioural approach in mitigating bullying behaviours of students. Another study conducted by Selvia et al. (2017) found out that cognitive restructuring which is a technique of Cognitive Behaviour Therapy (CBT) and Rational Emotive Behaviour Therapy (REBT) was effective in helping adolescents to think rationally and avoid these maladaptive behaviours. In the same line, Rini and Iswara (2020) found out that role-play exerted significant effect on the bullying behaviours of secondary school adolescents. Since previous studies utilized group counselling, thought stopping, cognitive restructuring, behavioural approach and role-playing in reducing bullying and these strategies were effective, the researchers of this study would like to use CBT in order to address the menace of bulling which has been bedeviling the school community in Taraba State.

According to Beck as cited in Ahmad (2019), CBT approach is a therapy that aims to change a client's cognitive or perception of a problem; thereby resulting in the client's change of emotions and behaviour. The main focus of CBT is to assist clients in examining and structuring maladaptive and dysfunctional core beliefs (Walters & Corey, 2013). The basic assumption of CBT approach is that the behaviour displayed is influenced by cognitive processes. With this in mind, CBT intervention not only focuses on changing behaviour of an individual but also intervenes in cognitive processes that affect emotions and behaviour. With regards to bullies, CBT can help restructure the illogical and irrational beliefs and thoughts of superiority over weaker students who they feel can easily be bullied. This can result in a

change of emotions and behaviours of the adolescent bully.

Bullying behaviours are a persistent problem in Nigerian schools specifically, schools located in Taraba State. Even though adequate researches have been conducted on bullying all over the globe, there is a dearth in research as regards to this behavioural problem (bullying) in Taraba State. While researchers like (Adamu et al. 2020; Amuche & Mbakwe, 2022) have conducted studies on deviant and social behaviours such as bullying, truancy etc., among students in Taraba State, these studies were surveys which rather than proffer appropriate intervention to handle the problem, only investigated the factors and consequences of the problem, and other variables such as relationship and counselling implication. Apparently, it has become necessary to delve into a study that can help students to adjust during the trying period of adolescence.

In the past years, teachers and the school management resort to corporal and other forms of punishments such as time-out, detention etc., in order to remedy the bullying behaviours exhibited by adolescent students. This strategy however, is far from effective as cases of bullying continue to be reported among secondary school students in Taraba State. This therefore calls for the utilization of more effective strategies and interventions. It is with this in mind that the researchers conducted this study in order to find out if CBT could be the most effective intervention that can be used in reducing the bullying behaviours exhibited by adolescent students in this region. The research hypotheses are:

1. There is no significant effectiveness of cognitive behaviour therapy in reducing bullying among adolescents in Taraba State, Nigeria.

2. There is no significant gender difference in the effectiveness of cognitive behaviour therapy in reducing bullying among adolescents in Taraba State.

2. Methods

2.1. Research Design, Statistical Population, Sample, and Sampling Method

This study is a quasi-experimental research which utilizes the pre-test, post-test design. Intact class was used as treatment group since the subjects were drawn from educational settings. This study was carried out in Jalingo Education Zone. The Education Zone is a region in the Northern part of Taraba State; one of the States in Northern Nigeria. This Education Zone is comprised of three Local Government Areas i.e., Jalingo, Ardo-kola and Lau.The population for this study was 3,222 SS1 students of the 2022/2023 Academic Session. Simple random sampling was used in selecting one Jalingo LGA from the three LGAs in the region. Thereafter, purposive sampling was used to draw a sample of 24 adolescents for the study. The sample subjects comprised of equal number of male and female adolescent students (i.e. 12 males and 12 females). In order to arrive at the sample size, the researchers conducted an administration of questionnaires to serve as baseline for the selection of participants for the study. 50 questionnaires were administered to the students of Government Day Secondary School Kofai, Ardo Kola.

After the administration, 24 adolescent students were identified as having moderate bullying behaviours. They were therefore selected to participate in the study.

2.2. Instruments

The instrument for data collection was a 30 items questionnaire titled "Adolescent Behavioural Problem Questionnaire (ABPQ)" the instrument has two sections; section A which contained the demographic information of the participants such as; gender, age and class while section B contained items designed to measure the subjects' Behavioural problems. In order to determine the content and construct validity of the instrument, the questionnaire was validated by two experts in counselling and psychology and one expert in measurement and evaluation from the Faculty of Education, Taraba State University, Jalingo. To ensure the reliability of the instrument, copies of the instrument were trial tested on a sample of 32 adolescent students with bullying behaviours who were drawn from two secondary schools in Zing LGA; an area not part of the study. The reliability index of the instrument was established using Pearson product moment correlation which yielded a reliability coefficient of 0.81.

The study was conducted in three phases. At the first phase, data for the study was collected during the baseline study or the first administration of questionnaires. At the second phase, the researchers designed 8-week treatment plan using techniques of CBT in order to expose the clients to the therapy. After the therapy, the questionnaire was administered to the participants as posttest.

The data collected was analyzed using inferential statistics of paired and independent samples t-test to test the hypothesis. The reason why the researchers chose this type of statistics is because, t-test is used in comparing the means of two matched groups of people or it is used in comparing the mean of a single group of cases examined at two different points in time (Ross & Willson, 2017).

3. Results

Paired samples t-test was used to test the first hypothesis of the research (Table 1).

Table 1.

Paired Samples t-test on the Effectiveness of CBT

Variable	Test	N	Mean	SD	df	t-cal	Sig (p)
Bullying	Pretest	24	18.04	3.55	23	2.248	0.009
Behaviours	Posttest	24	14.45	4.84			

P< 0.05, t computed > 1.96 at df 23

Results of the Paired sample t-test statistics in table 1 showed that CBT has significant effectiveness in reducing bullying behaviours (t = 2.848, p = .009). The mean score of the participants' bullying behaviour before exposure to the treatment was 18.04 and it was reduced to 14.45 after exposure to treatment, implying a mean reduction

difference of 3.59 in favour of the post test scores. This shows that CBT has positive effect in reducing bullying behaviours.

Independent samples t-test was used to test the second hypothesis of the research (Table 2).

Table 2.

Independent samples t-test on Gender Difference in the Effectiveness of CBT.

Variable	Test	N	Mean	SD	Df	t-cal	Sig (p)
Bullying	Pretest	12	12.41	2.71	22	-2.237	0.036
Behaviours	Posttest	12	16.50	5.71			

P> 0.05, t computed > 1.96 at df 18

The result of the above independent samples t-test statistics in table 2 shows that there is significant gender difference in the effectiveness of CBT in reducing bullying behaviours among adolescents in Jalingo Education Zone. The results of the independent samples t-test indicated that scores were significantly lower for the male participants (M = 12.41, SD = 2.71) than the females (M = 16.50, SD). Since a reduction in the mean implies positive effect of the treatment, the scores showed a gain of 4.09 in favour of the males. Thus, it can be concluded that in treating bullying behaviours among adolescents in Jalingo Education Zone, Taraba State, CBT proved to be more effective for the males than the females.

4. Discussion

The results indicate that there is significant effectiveness of CBT in reducing bullying behaviours among adolescents. The reason for such effectiveness could be attributed to the utilization of cognitive behavioural techniques which were embedded in the treatment package as designed by the researchers and used during the treatment sessions. This finding agrees with Santy and Machmuda (2019) who conducted a study on minimizing bullying behaviours. The researchers concluded that CBT is effective in reducing bullying behaviours among adolescents. The outcome of this study suggests that the utilization of CBT techniques in group sessions is effective in reducing bullying behaviours of individuals most especially adolescent students in senior secondary schools. The finding of the study also agrees with the finding of Efastri et al. (2015) who conducted a study on the reduction of bullying behaviours using behavioural approach. The researchers found out that bullying behaviours of students drastically reduced when they were exposed to behavioural approaches in the treatment sessions conducted. The finding is also in line with Selvia et al. (2017) in a study conducted to test the effectiveness of cognitive restructuring and thought -stopping techniques to reduce bullying behaviours. The researchers found out that those techniques when effectively utilized in group sessions helped reduce bullying behaviours among students. Similarly, the finding is in agreement with that of Asro et al. (2021) who found out that group counselling was effective in decreasing bullying behaviours

after the students were exposed to role-playing techniques. The finding is also in line with the finding of Rini and Iswara (2020) who carried out a study to find out the effectiveness of role-playing technique in reducing bullying behaviours. The researchers concluded that the techniques were effective in reducing bullying behaviours. CBT when used in a group counselling session helps adolescents developing empathy, and learning alternative strategies for conflict resolution. These findings suggest that CBT can be an effective intervention for addressing bullying behaviours among adolescents.

The results shows that there is a significant gender difference in the effectiveness of CBT in reducing bullying behaviours among adolescents. The reduction in bullying behaviours among male and female adolescents could be because of the utilization of cognitive restructuring techniques which sought to correct cognitive distortions related to bullying. The finding is in agreement with the finding of Yahaya and Ma'aruf (2014) who found out that the techniques of CBT proved to be more effective on male students than the females. However, Ekwelundu et al. (2022) found out in a study utilizing cognitive restructuring to reduce bullying behaviours that female participants benefitted more than male participants. However, this finding disagrees with the study conducted by Moses (2024) who utilized rational emotive behavior therapy; a form of CBT in order to reduce intolerant behaviours among secondary school adolescents. The researcher found out that the intervention was positively effective on both the male and female adolescents. In another study conducted by Aliero et al. (2023), the researchers found that CBT intervention exerted the same treatment on both the male and female participants of the study. Another study conducted by Chinweuba and Frank (2023) also found a dissimilarity. The researchers found out in their study utilizing CBT to reduce bullying that the therapy was equally beneficial to male and female participants. CBT as a counselling intervention has proven its effectiveness in remediating bullying behaviours that secondary school adolescents exhibit. Therefore, CBT is both beneficial to male and female adolescents.

The implication of these findings is that the government and non-governmental organizations could liaise with professional counselling bodies in order to organize workshops and seminars to sensitize and train psychologists/counsellors on how to effectively use techniques of CBT in helping adolescent students to reduce bullying behaviours. Another implication is that since gender did not exert any significant effect in reducing bullying behaviours, counsellors and psychologists could combine CBT with other techniques in order effectively reduce bullying among adolescent students.

5. Conclusion

The researchers conclude based on the findings of this study that Cognitive Behaviour Therapy (CBT) was effective in reducing bullying behaviour among adolescents. The study found out that techniques of CBT significantly reduced

bullying behaviours among adolescents. The findings therefore, indicate CBT when utilized in a group counselling session, is a valuable tool for reducing bullying behaviours which adolescents exhibit in the society.

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Conflict of interest

The researchers declare that there is no conflict of interest.

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Research Paper: The Correlation between Metacognitive Beliefs and Academic Performance in Students: Mediating Role of Learning Styles

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Abstract

Objective: Academically successful students may expect higher performance in their next projects, volunteer work, and study sessions. Consequently, the primary emphasis of educational experts has always been elements impacting academic performance. This article examined the mediating effect of learning styles in the interaction between metacognitive viewpoints and students's academic achievement.

Methods: This was descriptive, correlational study. Total number of female high school students in Astaneh Ashrafieh was 1,211. Random sampling enabled a cohort of 291 students to be chosen. Data were obtained with Academic Performance Questionnaire, Metacognitive Beliefs Questionnaire (MCQ) and Learning Style Orientation Measure (LSOM). Data analysis included structural equation modeling applied using SPSS-22 and Smart PLS 3.2.9 tools and correlation testing.

Results: The findings revealed that indirectly, metacognitive views influenced academic performance by means of learning techniques. Moreover, academic performance revealed rather strong and unambiguous links between metacognitive perspectives and learning techniques ($p < .05$).

Conclusion: Improved metacognitive views among students assist them to plan, define precise targets, track their learning activities and academic growth, and identify their strengths and flaws. Improving academic success and preventing academic failure depend on one focusing on the influence of metacognitive aspects and students' learning styles. At last, this study underlines how much learning techniques and metacognitive attitudes affect academic performance. The results reveal that by developing metacognitive abilities and appreciating various learning approaches, teachers may support their students in obtaining their academic goals quite efficiently.

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1. Introduction

Academic performance of students has been seen as a major indicator for assessing educational systems; all the efforts and actions of this system are in reality geared at accomplishing this goal (Saadipour et al., 2019). Measured with the help of teacher-made or standardized tests, academic performance—as used in relation to academic disciplines and themes—is the learnt and acquired competence of students (Talsma et al., 2019). When problems like academic failure and low academic performance emerge in an educational system, several motivational, cognitive, psychological, and environmental aspects are found as the causes of this negative performance (Marengo et al., 2019).

One of the issues that has gained the attention of academics and instructors lately is the different learning styles of students. Kolb (1984) argues that a more broad concept—that of personality—is composed of elements including learning style. The mysterious relationship between personality and cognition controls not just the overall learning process but also the specific approach people select in addressing challenges (Ramzani Garmi, 2022). People's learning style is defined by their beliefs, convictions, preferences, and activities they use to help in their own learning in a given environment (Husmann & O'Loughlin, 2019). Students approach their studies differently. Stated differently, students filter content through numerous lenses (Rezai Rafi & Rezai Manesh, 2018). Kolb's theory of learning styles holds that pupils achieve academic achievement when they can fit their learning style with the environment (Taleb, 2021). Considering the differences in learning styles, knowledge in this field helps teachers to be able to use various kinds of instruction in the classroom in a systematic way, thus surely this will improve the quality of learning in learners since the impact of learning style itself can have a wide and significant influence on the effectiveness and efficiency of education. Alizadeh and Yahek (2022) revealed in a research that self-regulated learning has a major influence in the relationship between metacognitive beliefs and academic procrastinating; the three components of positive beliefs about worry, cognitive confidence, and cognitive self-awareness with academic procrastination are negative and significant with the regard of self-regulated learning. Mousavi (2022) claims that research shows a clear link in academic success, responsibility, and motivation. Students with auditory, visual, and practical learning styles showed quite diverse academic performance and academic year according to Linca and Matei's (2024) research.

According to Taherzadeh Ghafarakhi et al. (2022), metacognitive views are people's ideas and beliefs about their own cognition, according to Wells (2001). The psychological frameworks, expertise, and procedures involved in managing, adjusting, and interpreting thoughts are referred to as metacognition. In actuality, metacognition is the mental experiences associated with people's behaviors and is a collection of knowledge that an individual possesses about their cognitive system (Shafiei &

Sharifzadeh, 2019). According to Wells (2011/2015), people's ideas—also known as metacognitive beliefs or knowledge—about their thoughts have the power to affect their emotions and moods (Abdulahi & Davoudi, 2017). Students' academic performance may be improved, and they can also be given the chance to properly identify their own strengths and weaknesses by developing their metacognitive views. Students that hold metacognitive beliefs will be better at processing information, which will improve their academic performance and lessen their propensity to retreat and put things off (Alizadeh & Yahek, 2022). When students have a clear understanding of their own talents, they can learn as much as possible successfully.

According to Cai et al. (2019), students utilize metacognitive methods when confronted with difficulties resulting from task performance; these strategies help to shape their goals. Studies by Ziegler and Opdenakker (2018) and Cikrikci (2016) subtly shown that academic procrastination might be predicted by metacognitive beliefs.

Considering individual differences among students in terms of metacognitive beliefs, efforts should be made to offer better learning conditions for successful academic performance since students are the greatest human capital of any society and given the relevance of academic performance in students' future career and personal life. By means of the identification of the link between the elements of metacognitive beliefs and the choice of learning strategies of students, an efficient step can be taken to improve their academic performance so enabling them to continue their education at higher levels and attain career success. This will help to ensure different academic performance. The present study sought to address the question: Is there a relationship between metacognitive beliefs and academic performance with the mediation role of learning —styles? Given very little research on this topic in Iran.

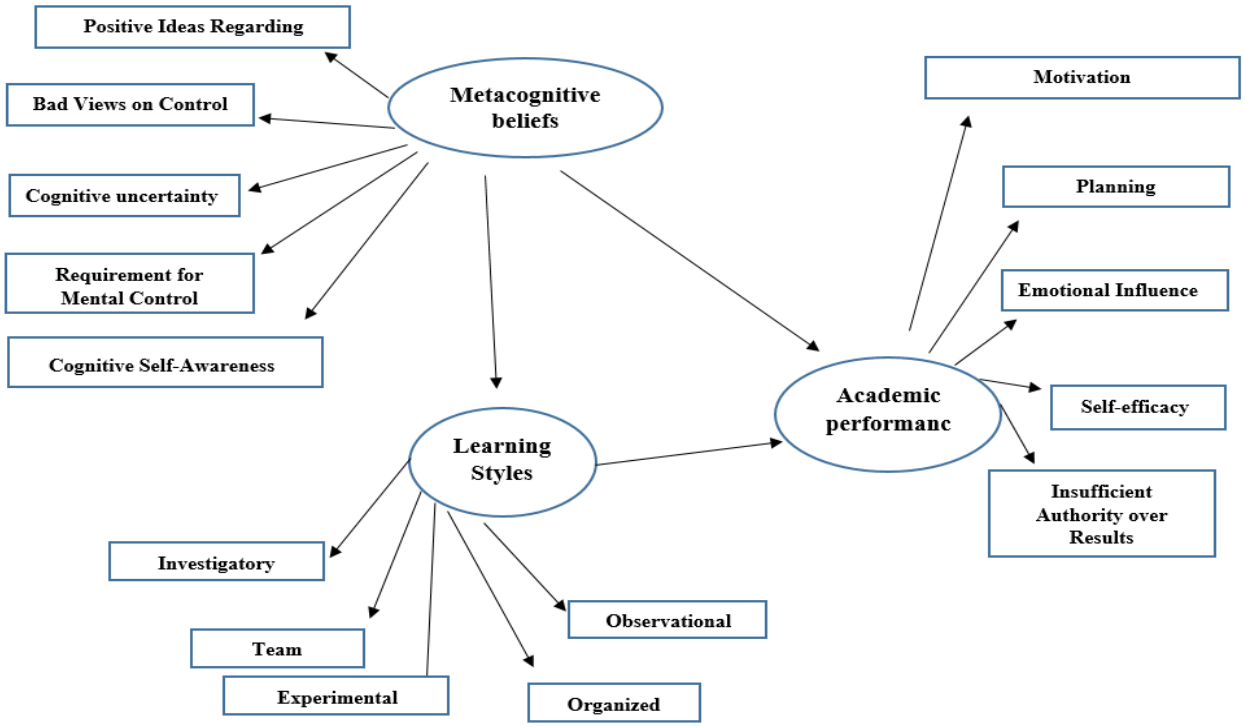

Diagram 1

Research Conceptual Model

2. Methods

2.1. Research Design, Statistical Population, Sample, and Sampling Method

Using correlation and structural equation modeling, this was a correlational study with an analysis of the relationships between the research variables.

The study's statistical population comprised 1211 female high school students from Astane Ashrafieh city who were enrolled in the academic years 2023–2024. Using the Krejcie and Morgan table, chosen through stratified random sampling according to the school population and grade level, the sample size was projected to be 292 based on Cochran's calculation.

2.2. Instruments

Educational Performance Questionnaire: Pham and Taylor created this quiz back in 1999. Using a five-point Likert scale (none, low, moderate, high, and very high), this 48-item questionnaire assesses academic performance in a number of areas, including self-efficacy (questions 29 to 36), emotional impacts (questions 12 to 19), planning (questions 1, 2, 3, 4, 8, 9, 10, 11, 40, 43, 44, 45, 46, 48), lack of outcome control (questions 5, 6, 7, 37, 38), and motivation (questions 20, 21, 22, 23, 24, 25, 26, 27, 28, 39, 41, 42, 47). Furthermore, questions 26 and 33 have different scores. Number 7 receives no points. Higher scores indicate greater academic success and vice versa. The

score range is 0 to 240. Using the Cronbach's alpha approach, Fam and Taylor (1999) obtained a reliability of 0.79 and supported the content validity of the instrument. Professors' views were used in Dortaj's (2004) research to validate content validity, and component analysis—which revealed the presence of five factors—supported construct validity. The reliability, as determined by the Cronbach's alpha technique, was 0.74 for the overall scale score and 0.92, 0.73, 0.93, 0.64, and 0.73 for the dimensions of motivation, self-efficacy, planning, emotional affects, and lack of outcome control.

Learning Style Orientation Measure (LSOM): Designed by Towler and Dipboye in 2003, this questionnaire has five subscales—exploratory learning styles (items 1–14), group learning styles (items 15–21), experiential learning styles (items 22–34), structured learning styles (items 35–45), and observational learning styles (items 46–54). There are 54 items total. A 7-point Likert scale runs responses from "strongly disagree" to "strongly agree." Cronbach's alpha calculated the questionnaire's dependability to be 0.97 (Huang et al., 2023), while its construct validity came out to be 0. 84. For the Iranian sample, Yurdkhani et al. (2023) noted a Cronbach's alpha of 0.70.

Metacognitive Beliefs Questionnaire (MCQ): The 30-item Wells and Cartwright's questionnaire (2004) evaluates metacognitive beliefs; so, in this study, people's opinions on their thinking were investigated using this four-point Likert scale: strongly disagree, slightly agree, moderately agree, and strongly agree. The aforementioned questionnaire has five subscales: questions 28, 23, 19, 10, 7, and 1 evaluate positive beliefs about worry; questions 21, 15, 11, 9, 4, and 2 evaluate negative beliefs about the controllability of thoughts and associated risks of worry; questions 29, 26, 24, 17, 14, and 8 evaluate cognitive uncertainty; questions 27, 25, 22, 20, 20, 13, and 6 evaluate the necessity of controlling thoughts; and questions 30, 18, 16, 12, 5, and 3 evaluate cognitive self-awareness metacognitive processes. Wells and Cartwright (2004) reported that Cronbach's alpha coefficients for the overall scale and subscales ranged from 0.87 to 0.59 for the former and from 0.93 to 0.76 for the latter depending on dependability. For the overall scale, the Cronbach's alpha coefficient of the Iranian sample was found to be 0.91; for the subscales of uncontrollability, positive beliefs, metacognitive awareness, cognitive confidence, and desire to regulate thoughts, respectively, it was 0.87, 0.86, 0.81, and 0. 71 (Shirinzadeh Dastagari, 2006).

2.3. Data Collection Procedure

They were given the research tools, which included metacognitive views, learning styles, and academic performance questionnaires on these areas. Out of the 292 questionnaires given to the students, 35 were not returned and 7 were eliminated from the study for incompleteness, therefore leaving 250 questionnaires for investigation. The students were guaranteed that the questionnaires were anonymous and that the results would be examined collectively, therefore observing ethical issues; all students engaged in the study with informed permission.

2.4.Data analysis Procedure

While inferential statistics were used at a significance level of ($P<0.05$) for the Pearson correlation test, path coefficients, and structural equation modeling, descriptive statistics were applied in the data analysis process to create frequency, percentage, and mean for the variables.

3. Results

The survey involved 250 female students overall; the 17-year-old age group accounted for 46.8% of the total participation frequency. Academic subjects were distributed as follows: 16.4% humanities, 12.8% experimental sciences, 2.8% mathematics, 18% graphics, 26.8% design and sewing, 11.6% architecture, and 11.6% accountancy. With 58.4% of all students in the 12th grade, this was the most often occurring grade.

Table 1

Mean and standard deviation of research variables

Variable	Mean	Standard Deviation
Planning	3.16	1.16
Insufficient Authority over Results	3.26	1.16
Emotional Influence	3.20	1.16
Motivation	3.21	1.15
Self-efficacy	3.19	1.15
Academic Performance	3.20	1.12
Investigatory	4.22	1.61
Team	4.17	1.63
Experiential	4.20	1.58
Organized	4.18	1.62
Observational	4.18	1.62
Learning Styles	4.19	1.56
Positive Ideas Regarding Anxiety	2.49	0.93
Bad Views on Control	2.54	0.93
Cognitive uncertainty	2.47	0.97
Requirement for Mental Control	2.51	0.91
Cognitive Self-Awareness	2.52	0.95
Metacognitive Beliefs	2.51	0.90

Based on the mean scores of the dimensions of the academic performance variable, Table 1 shows that the dimension of "lack of control over consequences," has the greatest average; the dimension of "planning," has the lowest average. Likewise, depending on the average scores of the several dimensions of the learning styles variable, the 'group' dimension has the lowest average and the 'exploratory' dimension has

the greatest average. At last, the dimension of "negative views about control" has the greatest average based on the average scores of the dimensions of the metacognitive beliefs variable; the dimension of "cognitive uncertainty" has the lowest average.

Table 2

Variables' correlation coefficient

	Academic Performance
Positive Ideas Regarding Anxiety	0.94**
Bad Views on Control	0.94**
Cognitive uncertainty	0.94**
Requirement for Mental Control	0.94**
Cognitive Self-Awareness	0.94**
Metacognitive Beliefs	0.97**
Investigatory	0.96**
Team	0.94**
Experiential	0.97**
Organized	0.96**
Observational	0.95**
Learning Styles	0.98**

** p≤ 0.01

Table 2 shows a substantial link between metacognitive beliefs and learning styles and academic performance (P<0.05). With regard to the sign of the correlation coefficient, the association between metacognitive beliefs and learning styles with academic performance is positive and notable (P<0.05). This implies that academic performance rises along with metacognitive views and learning styles as they do.

Table 3

Direct effects between variables

Path	*T*	*B*	Relationship	Conclusion
Metacognitive Beliefs → Academic Performance	2.445*	0.163	Positive	Approved
Learning Styles → Academic Performance	4.913*	0.439	Positive	Approved

*: At the 0.05 level the effect is notable.

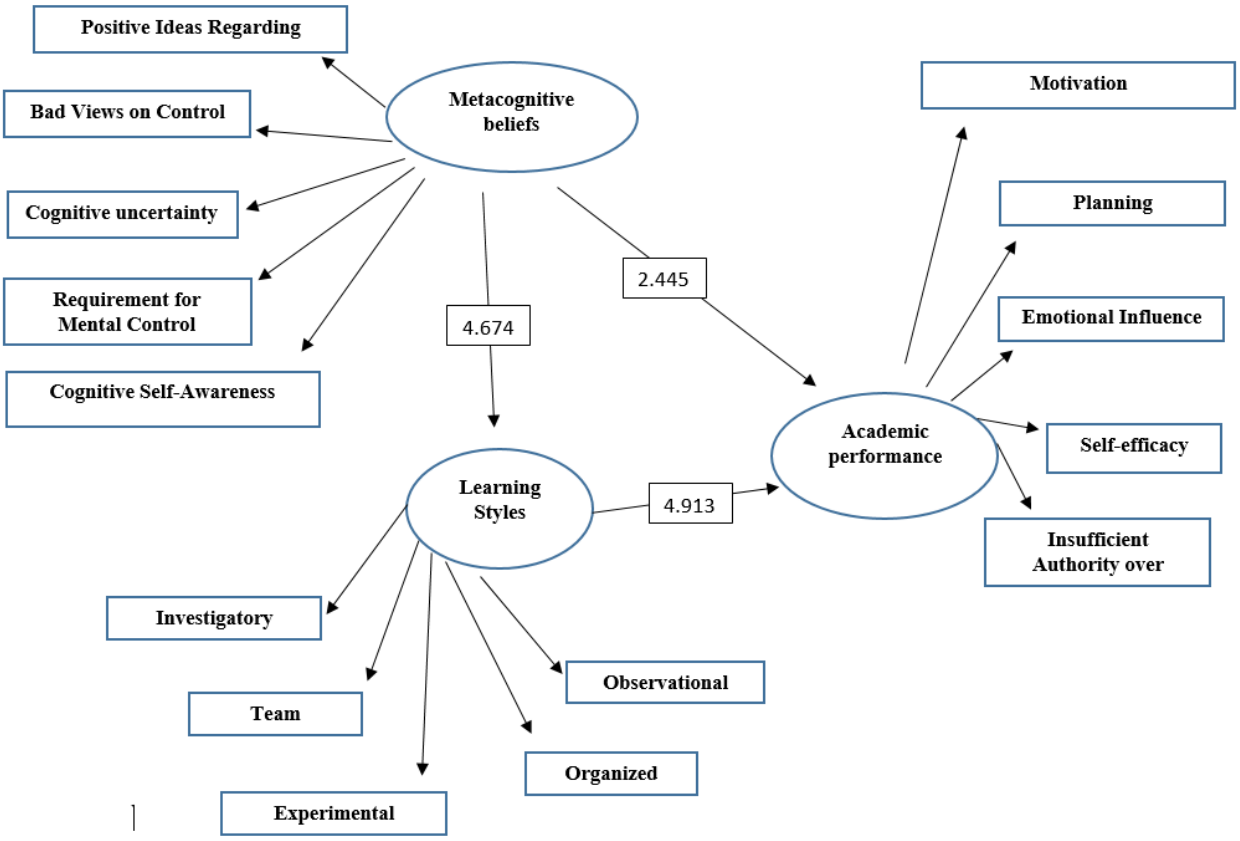

Diagram 2

Model variable absolute value of the t-statistic

Learning styles and academic performance have a noteworthy correlation since the absolute value of the t-statistic in the link between them (4.913) exceeds the minimum significant value of 1.96 (Table 3). Furthermore, the path coefficient of 0.439 shows that the component of learning styles directly explains almost 43% of the variability in academic performance. Learning styles and academic success thus have a good and notable relationship. Stated differently, the academic performance index greatly rises as the component of learning styles rises. As so, the second hypothesis is validated.

There is a notable link between metacognitive beliefs and academic performance since the absolute value of the t-statistic in the relationship between them (2.445) is more than the minimum significant value of 1.96 (Table 3). Furthermore, the path coefficient of 0. 163 shows that the component of metacognitive beliefs directly explains almost 16% of the fluctuations in academic performance. Thus, academic performance and metacognitive views have a favorable and noteworthy correlation. Stated otherwise, the academic performance index rises noticeably as the component of metacognitive beliefs rises.

Table 4

Indirect Interactions Among Variables

Path	*T*	*B*	Relationship	Conclusion
Metacognitive Beliefs → Learning Styles → Academic Performance	3.175*	0.121	Positive	Approved

*: At the 0.05 level the effect is notable.

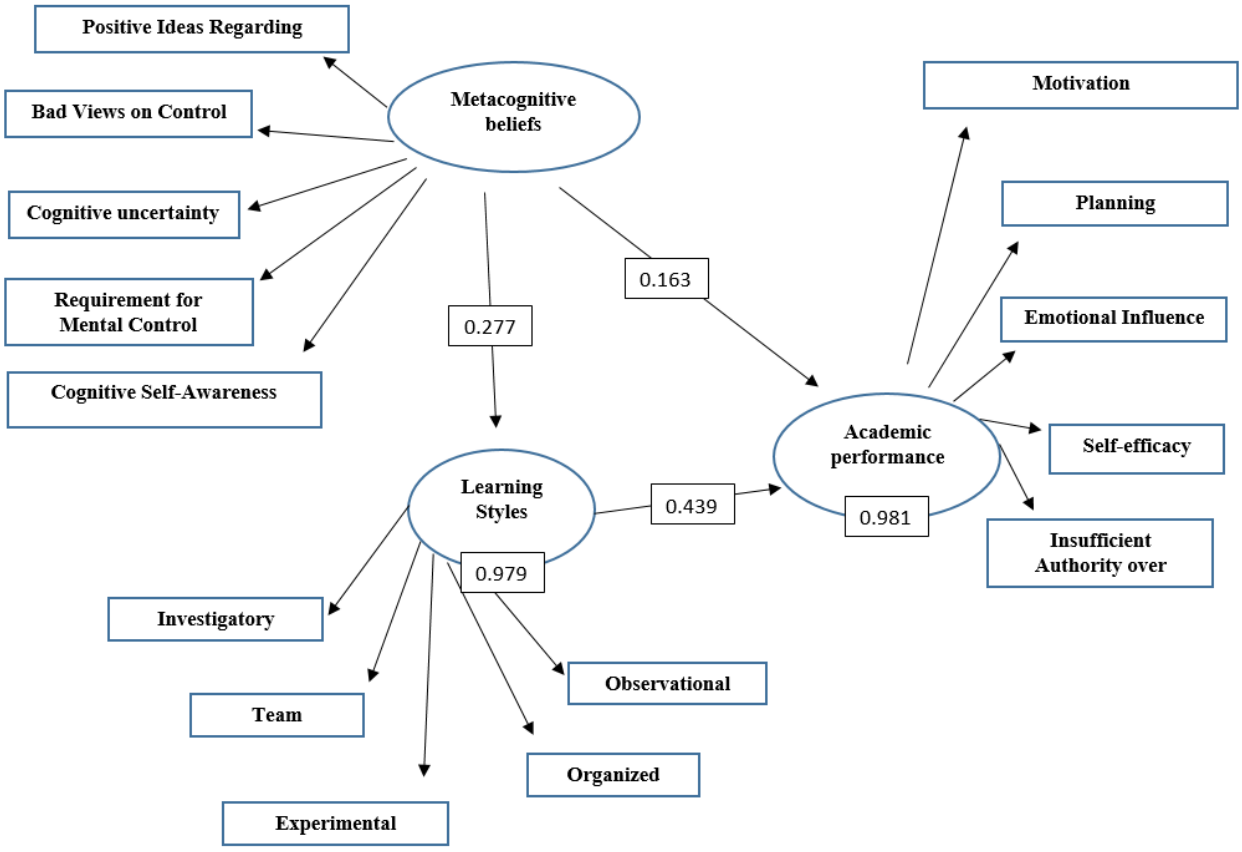

Diagram 3

Path coefficients among the model variables

The answers of the research at the 95% confidence level are clarified below considering the path coefficients and the absolute value of *t*: Learning styles can be argued to mediate the link between metacognitive beliefs and academic performance since the absolute value of *t* in the inverse relationship between them (3.175) is more than the minimum significant value of 1.96 (Table 4). The standardized coefficient β in the metacognitive beliefs table indicates that the mediation of learning styles indirectly explains around 12% of the variations in the academic performance variable.

We used Cohen's f^2, the Stone-Geisser test, and the coefficient of determination (R^2)

of latent and dependent variables to assess the structural model.

Table 5

Model's Determination Coefficient for Dependent and Latent Variables

Variable	R^2
Learning Styles	0.979
Academic Performance	0.981

Table 5 indicates that the coefficient of determination values for the dependent variables are robust.

Table 6

Coefficient Values of Impact for Each Latent and Dependent Variable

Construct	f^2
Learning Styles	46.619
Academic Performance	51.632

Table 6 illustrates that the substantial influence of the independent variables on the dependent variables in the linkages between the variables as indicated by high Cohen's coefficient values for them.

Table 7

Latent Variable Convergent Validity

Variable	Convergent Validity
Metacognitive Beliefs	0.881
Learning Styles	0.903
Academic Performance	0.899

Table 8

Model latent variable cross-valuation redundancy

Variable	Convergent Validity
Learning Styles	0.921
Academic Performance	0.92

It is noted from the preceding tables' values of *CV communality* and *CV redundancy* that the latent variables in the research have a decent predictive capacity. As so, the structural model fits really well. Additionally, applied in evaluation of the general structural equation model was the GOF fit index.

Table 9

Structural model and general research model fit indices

Construct	Communality	R^2
Metacognitive Beliefs	0.881	----
Learning Styles	0.903	0.979
Academic Performance	0.899	0.981
Mean of Criteria	0.902	0.98
$GOF = \sqrt[2]{Communality \times R^2} = \sqrt[2]{0.884} = 0.940$		

The GOF value for the research model is 0.940, indicating a strong fit of the research model," the table above shows.

4. Discussion

With learning styles acting as a mediating variable, this study looked at how metacognitive beliefs related to academic performance among students. As shown, variables of metacognitive beliefs and academic performance had a favorable and noteworthy link. Considering the negative scoring of the dimensions of negative beliefs about control, cognitive uncertainty, and the need for thought control, it can be concluded that while increasing positive beliefs about worry and cognitive self-awareness leads to an increase in academic performance, increasing negative beliefs about control, cognitive uncertainty, and the need for thought control leads to a decrease in academic performance. Furthermore, among the aspects of metacognitive beliefs, negative attitudes about control had the largest link with academic performance whereas the requirement of mind control had the lowest. Furthermore taken into account in view of the sign of the correlation coefficients between dimensions of learning styles and academic performance is the positive and substantial link between them. Consequently, it can be said that academic performance rises in every dimension of learning styles. Moreover, among the several aspects of learning styles, the group style showed the lowest link with academic success and the experienced style showed the strongest.

The results of this hypothesis align with the findings of studies by Alizadeh and Yahek (2022), Ostewar (2022), Taherzadeh Ghafarakhi et al. (2022), Mousavi (2022), Ghafarzadeh et al. (2022), Najafipour et al. (2021), Ali-Askarnjar et al. (2022), Armandeh et al. (2021), Masoumi et al. (2021), Ghadampour et al. (2019), Dehghani and Hektianfared (2019), Hashmipour et al. (2019), Yadalhifar and Mirzaei (2019), Silaj et al. (2021), Mahdavi et al. (2019), Jiang and Kleitman (2017), Ariastuti and Wahyudin (2022), Saleem et al. (2021), and Sabistin and Leung (2020).

It can be argued that a person's academic success influences their metacognitive beliefs—positive or negative—which helps to explain the acquired results. Should these views be negative, they negatively impact the academic performance of the pupil. When someone has favorable evaluation of their anxiety, they can even attempt to keep it

rather than try to manage it. Consequently, this anxiety itself causes anxiety and hence a poor performance. Someone who believes in danger and uncontrollability does not consider themselves as able of managing their anxious thoughts and concerns. They are quite sensitive to the degree of their concern and their incapacity to manage it; hence, too much worry causes the person to develop anxiety in a context like an exam. Weak cognitive confidence causes one to have little faith in their memory and themselves; this negative view lowers self-confidence and causes anxiety and stress in that regard. Strongly believing that they should be in charge of their ideas, someone feels compelled to be in charge of them and thinks they will be held responsible should they fail. This kind of thinking causes the person to have an improper sensitivity to managing their ideas; thus, the perspective that, should they be unable to control their thoughts, what implications it will have results in tension and anxiety in many spheres, including exam environments. Wells's model can also help one to understand these results. This paradigm holds that negative metacognitive beliefs guide one towards a negative assessment of anxieties and, hence, hyper-worry (Taherzadeh Ghafarakhi et al., 2022).

Given the general environment in schools and the kind of educational activities of teachers, this group of students shows better academic performance since students with a convergent learning style tend towards individual areas and projects, problem-solving, personal note-taking, and using educational materials provided by the teacher (Kolb, 2005). The findings reveal that students like the chance to ponder and reflect during their education as well as to view objects from many angles and precisely in order to look for ideas and interpretations. They also want to be involved in class and throughout learning, experience or try with every idea and thinking oneself to enjoy their learning. They have a real and active interest in issues. The student has to be able to view events from several angles and consider them; they also have to be able to completely interact with them with their own desire and free from bias. They have to be able to develop ideas and combine their observations with appropriate logical frameworks (Masoumi et al., 2021).

In another perspective, it can be claimed that students have different academic issues during their studies, and this is while they may not have enough cognitive and learning methods to deal with them, which raises the possibility of avoidance and procrastinating activities in the individual. Stated differently, having metacognitive beliefs in students will boost their information processing; this will raise their academic performance and lower their procrastination and disengagement. Furthermore acknowledged are metacognitive methods, which enable people to choose, regulate, monitor, manage, and thereby enhance cognitive processes. Usually using metacognitive skills, students who participate more actively in their academic destiny guide their learning process, take responsibility for their learning. This group of students achieves more development in learning since metacognitive methods lead to

improved usage and direction of cognitive strategies (Sardari and Ahmadzadeh, 2019).

Among the limits of this research, we can mention the use of questionnaires, which may have biases and exaggerations in estimating characteristics or memory errors; also, the method of exams and the learning situation of students can also work in favor of a particular learning approach, so resulting in different academic performance. Another restriction of this research is that it is single-sex (female students) and conducted for female high school students in the city of Astaneh Ashrafieh, which implies that future studies should be conducted on male students and in other cities; it is suggested that teachers be familiar with learning styles and their strategies and consider the individual differences of students in this area. Teaching metacognitive ideas and learning strategies to parents, teachers, professors, and other educational and training participants will help to guide planning to raise the academic performance standards.

5. Conclusion

Higher the degree of metacognitive beliefs among students, one might say that they would be better equipped to plan, identify and introduce specific goals, and build tactics considering their significance in assessing, monitoring, or managing students's thinking and capacity. They can also be aware of their learning activities and how their work is evolving minute by minute as well as acknowledge their strengths and weaknesses. These pupils are less anxious about the test and its outcomes as they also expect a fair and exact performance from themselves. They also control their ideas and keep an eye on and evaluate their skills, which allows them to be less anxious about their tests. Students who believe in the relative and complex character of knowledge, the acquired nature of learning ability, and the gradual character of the learning process feel more competent and efficient in learning and use higher-level metacognitive beliefs such cognitive self-regulation, so improving their academic performance. While negative beliefs can cause stress, anxiety, and worry about cognitive abilities, so a person with negative beliefs will not be able to control their thoughts and will lag in completing their homework; positive metacognitive beliefs can help people's perspective on their abilities to be in a positive direction (Alizadeh & Yahek, 2022). Supportive events include the impact of parents, mentors, past students, even academic activities might affect the development of learning techniques. One may therefore contend that learning and either improves or reduces academic performance depending on environmental limits and limitations, learning opportunities, and metacognitive beliefs.

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Conflicts of Interest

The Authors declare that there is no conflict of interest with any organization. Also, this research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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Research Paper: Normative Study and Psychometric Properties of the Digital Quotient Test in Children and Adolescents Aged 8-18 in the Iranian Community

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Abstract

Objective: Digital Quotient (DQ) refers to a comprehensive set of digital competencies derived from universal ethical values that aim to enhance human interaction with, controlling, and creating technology. The present study aimed to establish norms and examine the psychometric properties of the Digital Quotient Test in children and adolescents aged 8-18 in the Iranian community.

Methods: This study's population included students of the First and Second Elementary Schools and Tehran's First and Second Secondary Schools in the academic year 2020-2021. A total of 521 students (277 girls and 244 boys) were examined using a convenience sampling method. To analyze the data obtained from the test, inferential statistics were employed to determine construct validity, Pearson correlation matrix and test-retest reliability using SPSS software version 26.

Results: The results indicated that the construct validity of the Digital Quotient Test, using the internal consistency between its eight domains and the total score as evidence for this validity, was appropriate ($P < 0.05$). Using the test-retest method with a coefficient of 0.872, the test reliability was estimated to be relevant, too ($P < 0.01$).

Conclusion: The Digital Quotient Test has appropriate validity and reliability in children and adolescents aged 8-18 years in the Iranian community.

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1. Introduction

Humankind has experienced three industrial revolutions and is going through the fourth industrial revolution. These industrial revolutions have required specific skills and competencies (Marnewick & Marnewick, 2021). The first industrial revolution demanded physical skills and the use of industrial machinery (Drath & Horch, 2014); the second industrial revolution required cognitive skills with a focus on mass production (Liu & Grusky, 2013); the third industrial revolution emphasized the soft skills with a focus on emotional intelligence (Maqbool et al., 2017); and the fourth industrial revolution emphasizes the mastery of digital skills (Park, 2019). The fourth industrial revolution and rapid technological changes have created a gap between existing capabilities and the competencies required for various roles (Whysall et al., 2019). This revolution has led to fundamental changes in how we live, work, and interact with others, necessitating a new type of intelligence to face these profound changes. This new type of intelligence requires new competencies (Marnewick & Marnewick, 2021). The foundational skills for transitioning from physical, cognitive, and emotional skills to digital skills require an intelligence known as digital quotient (Marnewick & Marnewick, 2021).

The Digital Quotient enables individuals to interact successfully within the digital ecosystem and solve necessary issues in virtual environments (Adams, 2004). The International Society for Digital Quotient defines Digital Quotient as a comprehensive set of digital competencies derived from universal ethical values, which aim to enhance human interaction with, control over, and creation of technology (Park, 2019). This definition has two important aspects. First, an individual's digital skills and competencies should originate from ethical values. The second is that technology should be used to advance human progress, not to harm people and societies. NA-Nan et al. (2019) defines digital competencies as technical, cognitive, social, and emotional skills that enable individuals to face challenges and adapt to digital environments. This definition emphasizes not only technology but also the use of cognitive, social, and emotional competencies in dealing with the consequences and effects of technology. This aligns with Hirsch et al. (2019) definition, which still considers cognitive and soft skills important. According to Mithas and McFarline (2017), Digital Quotient involves aligning business strategies with information technology. This advantage encourages project managers to enhance their Digital Quotient skills. Cismaru et al. (2018) define Digital Quotient as the skill to understand and adapt to using digital/online concepts to solve online communication, information, and technological problems. This definition differs from others by focusing solely on online problem-solving, overlooking that technology can also be used in offline environments and human-tool interactions (Marnewick & Marnewick, 2021).

The Provincial Government of British Columbia, Canada, defines digital literacy as individuals' interest, attitude, and ability to

appropriately use digital technologies and communication tools to access, manage, integrate, analyze, and evaluate information, create new knowledge, and communicate and interact with others. This framework includes six characteristics of digital literacy: 1) information and research literacy; 2) critical thinking, problem-solving, and decision-making; 3) creativity and innovation; 4) digital citizenship; 5) communication and collaboration; and 6) technology use and related concepts (Ministry of Education of British Columbia, 2017). The Joint Research Center of the European Union has introduced the concept of a digital competency framework for citizens. The initial study of this framework began in 2005 and has been updated several times. This framework identifies 21 types of digital competencies in five areas: 1) information and data literacy, 2) communication and collaboration, 3) digital content creation, 4) safety, and 5) problem-solving.

In addition to the previous two frameworks, the Digital Quotient Society highlights a new type of intelligence called Digital Quotient (DQ). According to Park (2019), the founder of the Digital Quotient Society, digital intelligence encompasses eight domains: 1) digital identity; 2) digital use; 3) digital safety; 4) digital security; 5) digital emotional intelligence; 6) digital communication; 7) digital literacy; and 8) digital rights. The digital literacy framework in Indonesia underlines three aspects: protection, rights, and empowerment. The protection aspect includes protecting personal information, online security, and privacy. The rights aspect covers freedom of expression, intellectual property, and social activity. The empowerment aspect involves citizen journalism and ethical information principles. Each framework has unique characteristics, but all emphasize the competencies required for individuals to live successfully in the digital age (Taufigur et al., 2021). Table 1 shows the eight domains of Digital Quotient introduced by the Digital Quotient Society (2019) and the Institute of Electrical and Electronics Engineers ([IEEE], 2020).

One of the tools introduced for assessing Digital Quotient is the Digital Quotient (DQ) test, presented by the International Society for Digital Quotient based on the criteria of its revised version in 2018 (Park, 2019). The DQ test includes a set of cognitive, emotional, and social capabilities that enable individuals to become digital citizens who face challenges and adapt to the needs of life in the digital age. This test covers eight main domains: digital citizen identity, balanced use of technology, cyber risk management, cybersecurity management, digital empathy, digital footprint management, media, information literacy, and privacy management.

Na-Nan et al. (2020) examine the validation of the Digital Quotient Test using exploratory and confirmatory factor analysis on a sample group of employees from small and medium-sized enterprises in Thailand. The study is conducted in two phases. Initially, 33 questions are developed based on existing concepts and theoretical foundations in Digital Quotient. The questions are divided into eight dimensions using exploratory

factor analysis: digital identity, digital consumption, digital security, digital safety, digital emotional intelligence, digital communications, digital literacy, and digital rights. In the field survey, 409 questionnaires were administered. In the second phase, exploratory factor analysis and convergent validity were tested for the eight dimensions. The results indicate that the concept of Digital Quotient is derived from theoretical foundations, and the resulting questionnaire is usable for measuring this concept.

Kulworatite et al. (2021) aim to develop an internet risk assessment tool using the Digital Quotient Questionnaire and a communication-based model on a sample group of 400 individuals aged 18-36 years. They introduce seven components using exploratory factor analysis: digital identity, digital safety, digital emotional intelligence, digital rights, digital fear, digital greed, and irrational digital decision-making. In this study, the content validity of the questionnaire is reported as 0.85, and the reliability of the questionnaire using Cronbach's alpha is reported as 0.88.

Manakul and Tuamsuk (2021) conduct a meta-analysis to review the literature on Digital Quotient in educational environments. The analyzed documents are from international databases published in the past ten years. Twenty-three documents are reviewed, including 15 reports, nine research articles, and six scientific-educational articles. The research tool recorded qualitative information from the integration of the documents. The meta-analysis results indicate that the most important components of digital intelligence in educational environments are digital literacy, digital technology consumption, digital communications, and digital safety or risk management.

The expansion of digital technologies in social, economic, and personal life considers acquiring digital information skills as an important factor in individual success in social and civic life (Ertl, Sandy et al., 2020; Facer & Furlong, 2010; Van Deursen & Van Dijk, 2016). In today's information society, searching, evaluating, and processing information are important parts of daily life. The emergence of more advanced digital applications in the future highlights the necessity of acquiring digital information skills even further (Van Dijk, 2020). According to Castells (2010, as cited in Marnewick et al., 2021), informatization is observable in all professions, referring to information as the main source of productivity in many fields. The necessity of acquiring digital information skills as core competencies is particularly evident in professions in which the fundamental tasks involve searching, evaluating, and sharing information. Claro et al. (2018) found that only a minority of teachers can provide necessary guidance in solving digital information and communication issues for students, and the majority of teachers are reluctant to play a mediating role in students' issues related to virtual environments. Different attitudes among teachers in using information and communication technologies in education result in differences in the use of digital tools in schools, which are predictors of students' digital skills and, subsequently, differences in

students' digital capabilities (Lorenz et al., 2019). Given the necessity of assessing various domains of digital intelligence and determining educational programs related to enhancing these domains in students, the present study seeks to answer this question: Does the psychometric properties of the Digital Quotient test in children and adolescents aged 8-18 in the Iranian community have significant validity and reliability?

2. Methods

2.1. Research Design, Statistical Population, Sample, and Sampling Method

This study was applied in terms of purpose and in terms of implementation method was a descriptive survey type. The population of this study includes students aged 8-18 years of the First and Second Elementary Schools, the First Secondary School, and the Second Secondary School (1-12 grades) in Tehran during the 2020-2021 academic year. According to official statistics from the Ministry of Education in Tehran, 1.5 million students were enrolled during the 2020-2021 academic year. Cochran's formula for an unknown population was used to determine the sample size. Based on this formula, the minimum sample size was estimated to be 384 participants. The sampling method was convenience sampling, and due to the COVID-19 pandemic and the lack of in-person access to students, the test was administered electronically. After administering the test and excluding unsuitable responses for statistical analysis, 521 responses were used as the research sample. Thus, 521 students aged 8-18 years (277 girls and 244 boys) were studied.

2.1.Instruments

Digital Quotient (DQ) Test: The Digital Quotient test was developed by the International Society for Digital Quotient based on the criteria of its revised version in 2018. This test includes eight subscales: digital citizen identity, balanced use of technology, cyber risk management, cybersecurity management, digital empathy, digital footprint management, media and information literacy, and privacy management. The test contains 53 questions (excluding demographic questions) with various scoring methods, including dichotomous, multichotomous, 5-point Likert, and 7-point Likert scales. In the study by Kolorati et al. (2021), the content validity index of the questionnaire was reported as 0.85, and the reliability was reported as 0.88 using Cronbach's alpha. In this study, an initial translation of the test was carried out after obtaining permission from the International Society for Digital Quotient and its specialized team to use and standardize the tool for the Iranian community. The initial translation was then back-translated into English. Two experts carried out the back-translation, and after preparing the electronic version, the author provided the participants with it. Table 1 reports the sample description based on the questionnaire domains and the total score.

Table 1

Description of the Sample Based on Questionnaire Domains and Total Score

Variable	Minimum	Maximum	Mean	Question Number
Digital Citizen Identity	0	4	3.49	40
Balanced Use of Technology	16	55	35.86	3-4-5-6-7-8-9-10-11-12-13-14-15-16-17-18-19-20-21-52
Cyber Risk Behavior Management	8	36	26.55	43-44-45-46-49-50-51-54-55
Personal Cybersecurity Management	19	50	36.64	27-28-29-30-31-34-35-36-37-38-39-42
Digital Empathy	0	15	7.04	41-47-48
Digital Footprint Management	1	7	2.9	22-23
Media and Information Literacy	0	8	4.52	25-26-53
Privacy Management	0	9	7.07	24-32-33
Total Scale Score	78	160	127.136	Total questions

3. Results

In this study, descriptive statistics were used to obtain frequency, percentage, mean, and standard deviation, and inferential statistics were used to determine construct validity, Pearson correlation matrix, and test-retest reliability using SPSS software version 26. The mean and standard deviation of the students' ages were 13.77 and 3.188 years, respectively. The distribution of the sample by educational level was as follows: 1% first grade, 2.3% second grade, 9% third grade, 8.1% fourth grade, 10.4% fifth grade, 13.4% sixth grade, 7.7% seventh grade, 7.1% eighth grade, 4.8% ninth grade, 10.7% tenth grade, 16.5% eleventh grade, and 9% twelfth grade.

To examine the construct validity of the Digital Intelligence Test, the internal correlations between the eight domains of this test and the total score were used as evidence of this validity.

Table 2

Internal Correlations Between the Subscales of the Test and the Total Score

	Balanced Use	Cyber Risk Management	Cybersecurity Management	Digital Empathy	Digital Footprint	Media Literacy	Privacy Management	Total
Digital Citizen Identity	0.269 0.0001	0.365 0.0001	0.221 0.0001	-0.108 0.013	-0.093 0.033	0.145 0.001	0.269 0.0001	0.412 0.0001
Balanced Use of Technology	-	0.048 0.270	0.216 0.0001	-0.061 0.166	0.105 0.017	0.293 0.0001	0.181 0.0001	0.629 0.0001
Cyber Risk Behavior Management	-	- 0.0001	0.329 0.0001	0.024 0.589	-0.121 0.0001	0.312 0.0001	0.379 0.0001	0.560 0.0001
Personal Cybersecurity Management	-	-	-	0.054 0.219	0.121 0.006	0.274 0.0001	0.464 0.0001	0.759 0.0001
Digital Empathy	-	-	-	-	0.080 0.067	0.035 0.423	0.040 0.365	0.198 0.0001
Digital Footprint Management	-	-	-	-	-	0.192 0.0001	0.013 0.773	0.214 0.0001
Media and Information Literacy	-	-	-	-	-	-	0.215 0.0001	0.517 0.0001
Privacy Management	-	-	-	-	-	-	-	0.585 0.0001

Table 2 showed the pairwise correlations of the subscales with each other and with the total score. The significance level of each correlation coefficient is reported below that. Based on the results in Table 2, significant relationships were found between the subscales, and the correlation between the subscales and the total score was more significant than the pairwise correlations between the subscales of this pattern is evidence of construct validity.

To examine the reliability of the Digital Intelligence Questionnaire, the test-retest method was used. Thirty students completed the test again after three weeks. The Pearson correlation coefficient between the two administrations is calculated and reported in Table 3.

Table 3
Reliability of the Digital Intelligence Test

	Variable	Pearson Correlation Coefficient Between Two Administrations
1	Digital Citizen Identity	0.525 0.002
2	Balanced Use of Technology	0.680 0.0001
3	Cyber Risk Behavior Management	0.614 0.0001
4	Personal Cybersecurity Management	0.538 0.002
5	Digital Empathy	0.538 0.002
6	Digital Footprint Management	0.587 0.001
7	Media and Information Literacy	0.567 0.001
8	Privacy Management	0.625 0.0001
9	Total Score	0.872 0.0001

Table 3 showed that the correlation coefficients between the two administrations at the 99% level in subscales and total score are significant. It can be concluded that the Digital Intelligence Test has appropriate test-retest reliability, with the coefficient for the total score being 0.872.

4. Discussion

The present study aimed to establish normative data and examine the psychometric properties of the Digital Quotient Test in Iranian children and adolescents aged 8 to 18. To assess the construct validity of the Digital Quotient Test, the internal correlations between the eight domains of this test and the total score were used as evidence for this validity. The results indicated that the test has appropriate construct validity. The test-retest method was employed to examine the reliability of the Digital Quotient Test. The results showed that the Digital Quotient Test has appropriate test-retest reliability, with a coefficient of 0.872 for the total score. The results of the present study were consistent with the studies conducted by Na-Nan et al. (2020), Kulworatit et al. (2021), and Manakul and Tuamsuk (2021).

According to Van Laar, et al (2020b), a digital appendix is needed for each of the

21st-century skills, including technical, communication, collaboration, critical thinking, creativity, and problem-solving skills. For example, digital communication skills include transferring information online through social media, email, and online chat. Digital information retrieval skills include searching for information from digital sources and evaluating the usefulness and credibility of the received information. Van Laar et al. (2020a) emphasized that digital skills have a sequential and conditional nature, meaning they build upon one another. There is a significant gap between the skills students acquire through formal education and the skills needed for living and working in the 21st century (Lau & Yuen, 2014). Formal education has not been sufficient in enhancing students' competencies, indicating a need for preparedness, skillfulness, and progress toward enhancing digital competencies (Hatlevik & Hatlevik, 2018). Therefore, an assessment tool for such digital competencies to develop necessary educational programs suited to the context of the Iranian community appears essential.

One limitation of the present study is the data collection method, conducted electronically due to the COVID-19 pandemic. To enable comparative studies, it is suggested that the test be normed in cities other than Tehran. This research was conducted on students in Tehran. It is suggested that such a study be carried out on the students of other cities as well.

5. Conclusion

The findings showed that the Digital Quotient Test has appropriate construct validity and appropriate test-retest reliability in children and adolescents aged 8-18 in the Iranian community. Therefore, In the digital age, there is a need for preparedness, skillfulness, and the movement toward enhancing digital politics.

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Conflict of Interest

The Authors declare that there is no conflict of interest with any organization. Also, this research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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Research Paper: Prediction of Emotional Divorce based on Family Communication Patterns with the Mediating Role of Marital Burnout in Married Female Teachers of Darab City

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Abstract

Objective: This study aimed to predict emotional divorce among married female teachers in Darab City by analyzing family communication patterns and examining the mediation effect of marital burnout.

Methods: Descriptive and correlational analyses were used. All married female instructors employed at the Darab primary schools during the academic year 2023-2024 were the study's population. The census technique was employed to estimate the sample, estimating the population of 176 individuals. The Revised Family Communication Patterns Scale (RFCP), Couple Burnout Measure (CBM), and Gottmanns Emotional Divorce Scale (GEDS) were used to collect data. The data were analyzed using structural equations (SEM) and Pearson's correlation test, and the findings were examined using Lisrel 9 and SPSS25 statistical software.

Results: Marital boredom had a direct and significant association with emotional divorce, and it had an inverse and significant relationship with communication orientation and compliance orientation. There was a direct and significant correlation between emotional divorce and conformity orientation, and an inverse and significant correlation between emotional divorce and communication orientation. Marital boredom also acted as a mediator in the interaction between emotional divorce and family communication styles ($p<0.05$).

Conclusion: Thus, it can be anticipated that as the family's conformance orientation increases, the rate of marital discontent will rise as well, and that as this variable rises, so too will the emotional divorce rate.

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1. Introduction

Marriage and marital relationships are widely recognized as significant sources of social support, intimacy, and emotional fulfillment. They promote cooperation, empathy, and a sense of unity and affection within the family unit. Successful marriages, characterized by achieving shared goals, are associated with satisfaction and happiness. Conversely, marital discord and dissatisfaction can negatively affect individual well-being and the overall quality of the marital relationship (Lotfi et al., 2019).

Emotional divorce occurs when the functions of a family break down, and the system faces numerous challenges. This state indicates the family's failure to cultivate values, cultural beliefs, and emotional, sexual, and social behaviors. A dysfunctional family is characterized by disorganization, a disregard for rules, neglect of one another, maladaptive behaviors, conflict, violence, and irresponsibility (Dehghani Tafti et al., 2019).

In an emotional divorce, couples grapple with various issues such as destructive verbal and physical arguments, prolonged silences, emotional and physical distance, sexual dissatisfaction, psychosomatic illnesses, and decreased self-esteem (Rezaei Moghadam, 2019). The emotional divorce precedes the legal divorce and is the most significant factor contributing to the disintegration of the family, the most fundamental unit of society. Emotional divorce is not a singular phenomenon but rather a result of a confluence of factors. The impact of these factors on causing emotional divorce varies. For instance, the unmet emotional needs of one spouse may play a more significant role in disrupting a marital relationship than the other. The suppression and unfulfilled needs over a prolonged period of shared life lead to the individual's defeat, isolation, and a fundamental psychological separation from the spouse, resulting in extensive personal and familial harm (Enayatpour, 2016).

One factor that seems to be linked to emotional divorce is marital apathy (Pokorska et al., 2013). Apathy is a state of physical, emotional, and psychological exhaustion that results from a mismatch between expectations and reality. Apathy arises from failed love and is a response to existential issues. The accumulation of debilitating psychological pressures, a gradual increase in fatigue and monotony, and the hardening of small pains contribute to the development of apathy (Hadian & Amini, 2019).

Apathy is an unfulfilled desire for a satisfying mental activity, a repugnant state characterized by poor self-regulation. There is ample evidence that daily physical and mental fatigue is associated with inattention (Yakobi et al., 2021). Marital apathy is a gradual decrease in emotional desire and interest in one's spouse, accompanied by feelings of alienation, indifference, and apathy towards each other, with negative emotions replacing positive ones (Poorhejazi et al., 2021).

In addition, it appears that family factors, such as family communication patterns (organizational indifference), also influence emotional divorce in couples. The

communication pattern of couples is the communication channel through which husbands and wives interact with each other. It is also expected that one of the cognitive, behavioral, and emotional factors affecting the quality of marital relationships is family communication patterns (Buser et al., 2019). Couples' communication patterns in families are a process through which husbands and wives interact with each other verbally and nonverbally (Parvandi et al., 2016).

Two fundamental dimensions have been proposed in family communication patterns: conversation orientation and conformity orientation (Fitzpatrick & Ritchie, 1994). In families with a conversation orientation, family members interact frequently and spontaneously, discuss various topics freely, and make family decisions through collaboration. However, in a conformity orientation, family relationships emphasize similar feedback, values, beliefs, and avoidance of conflict (Koerner & Fitzpatrick, 2002). Malekizade et al. (2016) found a significant relationship between dimensions of family communication patterns and emotion regulation, indicating that these dimensions can predict emotion regulation in couples.

Emotional divorce is a sensitive issue in both our society and others, and it becomes even more significant when considering a group like teachers. The potential negative consequences of neglecting this issue are far-reaching and could soon affect society. Given the importance of teacher well-being in modern societies, understanding teachers' psychological, emotional, and social needs and abilities is crucial. While previous research has explored emotional divorce, it has been unable to provide a comprehensive explanation of the relationships between this variable and influential factors such as marital dissatisfaction and family communication patterns. Therefore, given the characteristics of emotional divorce, it is expected that there is a relationship between family communication patterns and emotional divorce, with marital dissatisfaction acting as a mediator. The primary objective of this study is to answer the following question: Does marital dissatisfaction mediate the relationship between emotional divorce and family communication patterns?

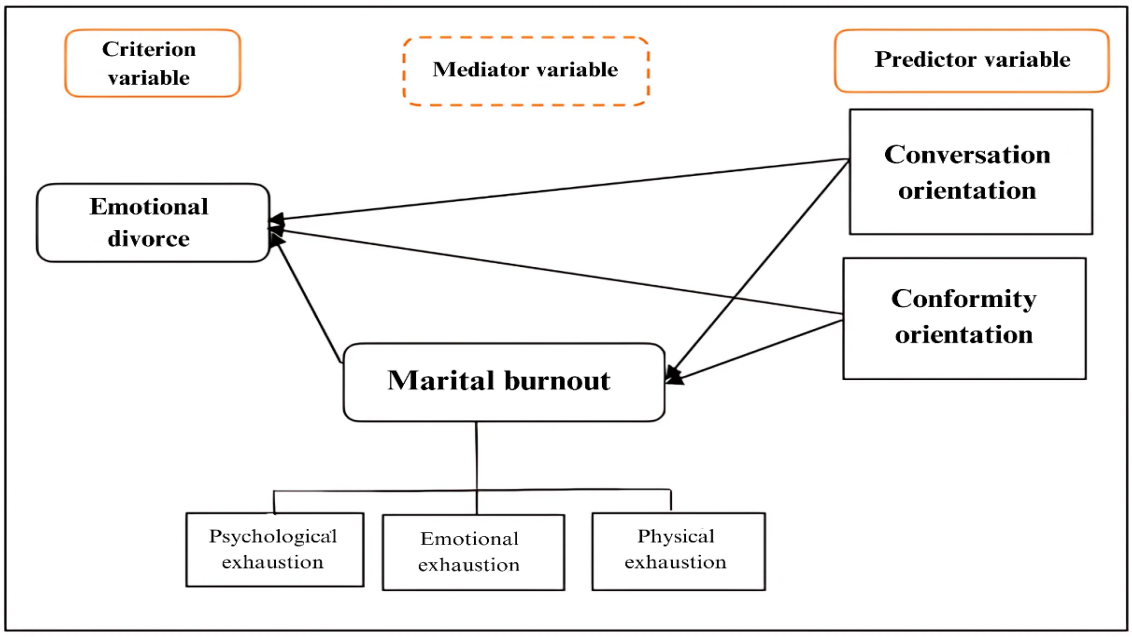

Diagram 1: Conceptual Model of the Study

2. Methods

2.1. Research Design, Statistical Population, Sample, Sampling Method and Data Analysis Procedure

This study is an applied, descriptive-correlational research. The target population comprised all married female elementary school teachers in Darab City during the 2023-2024 academic year, totaling 176 individuals, as per the education department. Given the relatively small population size, a census method was employed to select the entire population as the sample. Data analysis involved using Pearson correlation and structural equation modeling (SEM), with SPSS 25 and LISREL 9 software utilized for statistical analysis.

2.2. Instruments

Gottman Emotional Divorce Questionnaire (GEDS): For this study, the Gottman Emotional Divorce Questionnaire (2008) was employed to measure emotional divorce. This instrument comprises 24 items designed to assess the degree of emotional detachment within marital relationships. The questionnaire utilized a 5-point Likert scale (ranging from very low (1) to very high (5)). The total score ranged from 24 to 120, with higher scores signifying a greater likelihood of emotional divorce.

Previous research by Mami and Safarnia (2018) reported a Cronbach's alpha of 0.83, indicating the questionnaire's reliability. Furthermore, field experts have positively evaluated the questionnaire's content validity. In the present study, the questionnaire's validity was further

confirmed through expert review by doctoral-level professors in educational sciences and psychology at Azad University of Darab. To assess the scale's reliability, Cronbach's alpha was calculated on a sample of 30 participants, yielding a value of 0.92, thus demonstrating satisfactory reliability for the entire thesis.

Couple Burnout Measure (CBM): This self-report questionnaire was designed by Pines (2004) to measure marital boredom among couples. It comprises 20 items assessing symptoms of burnout across three primary dimensions: physical exhaustion (e.g., fatigue, weakness, sleep disturbances), emotional depletion (e.g., depression, hopelessness, entrapment), and psychological depletion (e.g., worthlessness, frustration, anger towards one's partner). Respondents rate each item on a seven-point Likert scale, ranging from 1 (no experience) to 7 (significant experience).

The CBM has demonstrated strong psychometric properties. As measured by Cronbach's alpha, internal consistency typically ranges from 0.84 to 0.90. The instrument's validity has been supported by negative correlations with positive relationship characteristics. The CBM's cross-cultural applicability has been established through its successful use in various countries, including Norway, Hungary, Mexico, Spain, Portugal, Finland, and Israel (Pines & Nunes, 2003). Adib Rad et al. (2005) found test-retest reliability coefficients of 0.89, 0.76, and 0.66 for one-, two-, and four-month intervals, respectively. The instrument's internal consistency, assessed by Cronbach's alpha, typically ranges from 0.91 to 0.93 (Pines, 1996; translated by Shadab, 2001). In the current study, the validity of the questionnaires was evaluated by experts in educational sciences and psychology. Cronbach's alpha, calculated for a sample of 30 participants, yielded a value of 0.85, indicating the questionnaire's reliability.

The Revised Family Communication Patterns Scale (RFCP): This scale originally developed by Ritchie (1972) and later revised by Koerner and Fitzpatrick (2002), is a self-report instrument that measures individuals' perceptions of family communication patterns. The scale consists of 26 items rated on a five-point Likert scale, ranging from *strongly agree* to *strongly disagree*. The RFCP assesses two primary dimensions: conversation orientation and conformity orientation. Conversation orientation reflects the degree to which family members are encouraged to communicate frequently and openly; however, conformity orientation measures the extent to which family members are expected to adhere to shared values and beliefs.

Fitzpatrick and Ritchie (1994) reported satisfactory psychometric properties for the scale, including content validity, criterion validity, construct validity, and reliability (Cronbach's alpha and test-retest reliability). Koerner and Fitzpatrick (2002) further supported the scale's content validity. Criterion validity has been demonstrated through correlations between family types and underlying dimensions of the typology with theoretically related measures (Koerner

& Fitzpatrick, 2002). In the Iranian context, Koroushnia and Latifiyan (2006) employed principal component analysis to assess the scale's validity. The factor loading was found to be 0.85, and Bartlett's sphericity test yielded a significant result ($p < 0.005$), indicating satisfactory validity.

Koroshnia & Latifian (2008) reported satisfactory reliability for the Family Communication Patterns Questionnaire, with Cronbach's alpha coefficients of 0.87 and 0.81 for the conversation and conformity orientation subscales, respectively. Test-retest reliability coefficients were 0.84 and 0.78, respectively. In the present study, content validity was established through expert review by university professors in education and psychology. The Cronbach's alpha coefficients of 0.88 and 0.91 for the conformity and conversation orientation subscales, respectively, indicated satisfactory internal consistency reliability.

3. Results

The descriptive statistics section presented demographic information on the participants, including gender, age, and education level. The majority of respondents (65.9%) were aged 20-30, significantly outnumbering other age groups. Regarding marital duration, 53.9% of participants had been married for 6 months to 2 years, followed by 24.4% for 2-5 years, and 21.7% for 5 years or more.

The primary variables were described using mean and standard deviation. The emotional divorce and communication patterns variables were measured on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree), with a neutral midpoint of 3. Conversely, the marital boredom variable was measured on a 7-point Likert scale (1 = strongly disagree to 7 = strongly agree), with a neutral midpoint of 4.

Table 1

Operational Definitions of Primary Variables

Variables	Mean	Standard Deviation
Emotional Divorce	2.89	0.651
Marital Burnout	4.23	0.743
Communication Orientation	2.41	0.542
Conformity Orientation	2.09	0.724

The descriptive statistics presented in Table 1 indicated that the means of the study variables ranged from a low of 2.09 for conformity orientation to a high of 4.23 for marital dissatisfaction. Notably, the mean score for marital dissatisfaction was slightly above the average, while the means of the other variables were slightly below the average.

The Kolmogorov-Smirnov test was employed to assess the normality of the data distribution. The results of the Kolmogorov-Smirnov test showed that the Z-statistics for the variables of emotional divorce, marital

burnout, communication orientation, and conformity orientation were 0.112, 0.094, 0.142, and 0.104, respectively, which in all cases had a significance level higher than 0.05; therefore, the data have a normal explanation. Consequently, based on the outcomes of the Kolmogorov-Smirnov test, it can be inferred that the distribution of all variables approximated a normal distribution, thereby validating the application of parametric statistical tests, such as Pearson correlation and structural equation modeling with LISREL.

Table 2 presents the Pearson correlation coefficients, demonstrating the relationships between the study variables. Since the normality assumption was met, as confirmed by the normality test, the Pearson correlation coefficient was employed for data analysis.

Table 2

Matrix of Pearson Product-Moment Correlation Coefficients for the Study Variables

Variables	Conversation	Conformity	Marital Burnout
Conversation Orientation	1		
Conformity Orientation	**-0.26	1	
Marital Burnout	**-0.45	**0.35	1
Emotional Divorce	**-0.23	**0.27	**0.63

** p≤0.05 ** p≤0.01*

The findings revealed significant correlations among all four primary variables ($p < 0.05$). Notably, the dependent variable, *emotional divorce*, demonstrated significant associations with all the other variables. A particularly strong correlation was observed between *emotional divorce* and *marital disenchantment*, with a correlation coefficient of 0.63.

The proposed research model was empirically tested using structural equation modeling (SEM) with LISREL 9 software. Figure 1 illustrates the research model with significant t-values, while Figure 2 depicts the model with standardized coefficients.

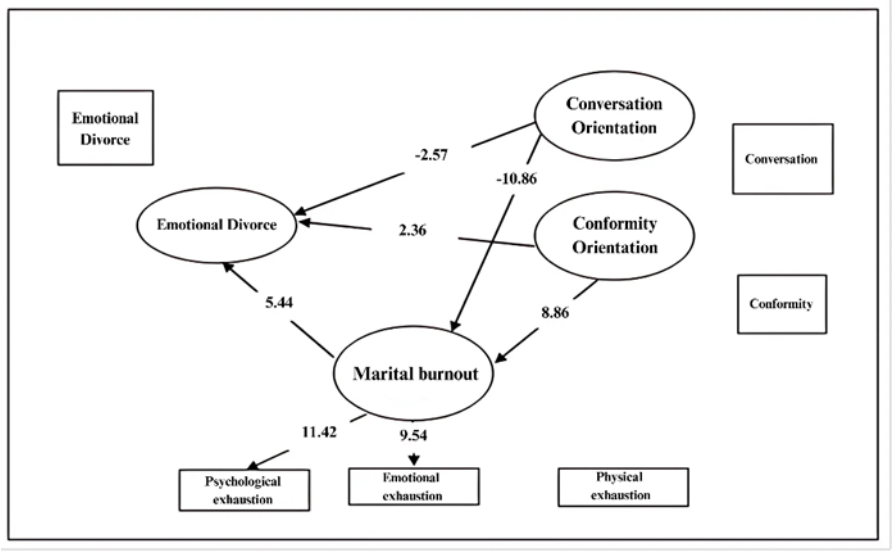

Figure 1

Standardized Coefficient Estimates of the Empirical Model

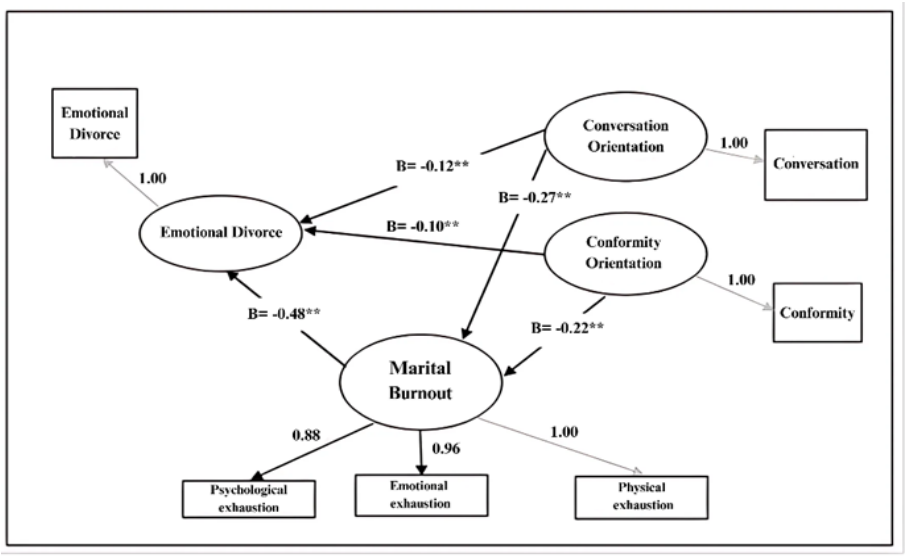

Figure 2

Value Estimates of the Empirical Model

Figure 1 illustrated the model, highlighting the t-values for each path at significance levels. A t-value exceeding 1.96 indicated a statistically significant relationship at the 0.05 level ($p < 0.05$). The presented t-values confirmed the significance of all relationships within the model ($p < 0.05$).

Figure 2 displayed the model with standardized coefficients, which provided a standardized measure of the strength of the relationships between variables. Higher

coefficient values signify stronger relationships. Among the relationships in the model, the strongest influence is observed between marital disillusionment and emotional divorce, with a standardized coefficient of 0.48.

Table 3 presents the model fit indices. After estimating the model parameters, it is essential to assess the model's fit to the data. This involves evaluating various fit indices to determine the extent to which the proposed model aligns with the observed data. As Kalantari (2012) emphasizes, ensuring a good model fit is crucial before interpreting the parameter estimates.

Table 3
Model Fit Indices

Indices	Acceptable Value	Result	Interpretation
GFI (Goodness of Fit Index)	>0.90	0.93	Acceptable Fit
RMSEA (Root Mean Square Error of Approximation)	<0.80	0.70	Acceptable Fit
CFI (Comparative Fit Index)	>0.90	0.92	Acceptable Fit
NFI (Normed Fit Index)	>0.90	0.93	Acceptable Fit
IFI (Incremental Fit Index)	>0.90	0.92	Acceptable Fit
AGFI (Adjusted Goodness of Fit Index)	>0.50	0.91	Acceptable Fit
PGFI (Parsimonious Goodness of Fit Index)	>0.50	0.78	Acceptable Fit
Chi-Square /Df (Chi-Square divided by degrees of freedom)	1 ≤index≤ 5	2.81	Acceptable Fit

As shown in Table 3, the fit indices collectively indicated a satisfactory model fit to the data. Given these results, the proposed model was deemed acceptable.

Table 4 presents the results of the structural model assessment. The structural equation modeling analysis confirmed the hypothesized relationships between the variables ($p < 0.05$).

Table 4

Structural Equation Modeling Results (Coefficient Table)

Type of Relationship	Standardized Coefficient	t-value	p-value	Result
Communication Orientation → Marital Burnout	-0.27	-10.86	0.001<0	Supported
Conformity Orientation → Marital Burnout	0.22	8.86	0.001<0	Supported
Marital Burnout → Emotional Divorce	0.48	5.44	0.001<0	Supported
Communication Orientation → Emotional Divorce	-0.12	-2.57	0.001<0	Supported
Conformity Orientation → Emotional Divorce	0.10	2.36	0.001<0	Supported

Given the research hypothesis that marital burnout mediates the relationship between family communication patterns (conversation-oriented and conformity-oriented) and emotional divorce among married female teachers in Darab City, Table 5 presents the results of the indirect effect analysis. The table details the direct, indirect, and total effects of conversation-oriented and conformity-oriented communication patterns on emotional divorce.

Table 5

Mediation Analysis: The Impact of Family Communication Patterns and Marital Burnout on Emotional Divorce

Mediator	Dependent Variable	Independent Variable	Direct Effect	Indirect Effect	Total Effect	Result
Marital Burnout	Emotional Divorce	Communication Orientation	**-0.12	**-0.13	-0.25	Mediation Supported
		Conformity Orientation	0.10	0.11	0.21	Mediation Supported

** p≤0.05 ** p≤0.01*

The findings of this study confirm the mediating role of marital alienation in predicting emotional divorce among married female teachers in Darab City, as influenced by communication patterns of conversation and harmony ($p < 0.05$). Specifically, the research model analysis revealed that the direct effect of conversation orientation on emotional divorce increased from -0.12 to -0.25 when marital alienation was introduced as a mediator. This supported the hypothesis that marital alienation mediates the relationship between conversation orientation and emotional divorce. Consequently, it can be inferred that as conversation orientation within families

increases, marital alienation decreases, leading to a reduction in emotional divorce.

Similarly, the direct effect of harmony orientation on emotional divorce increased from 0.10 to 0.21 with the introduction of marital alienation as a mediator. This finding further substantiated the mediating role of marital alienation in the relationship between harmony orientation and emotional divorce. Therefore, it can be anticipated that as harmony orientation within families increases, marital alienation increases, ultimately leading to an increase in emotional divorce.

In conclusion, this study demonstrated the significant mediating role of marital alienation in predicting emotional divorce based on the communication patterns of families of married female teachers in Darab City.

4. Discussion

The results of this study confirmed the mediating role of marital alienation in predicting emotional divorce among married female teachers in Darab, based on communication patterns. Specifically, the research model revealed that conversation-oriented communication had a direct negative effect on emotional divorce which was further amplified to -0.25 when marital alienation was included as a mediator. This indicated that marital alienation mediated the relationship between conversation-oriented communication and emotional divorce. Consequently, it can be inferred that as conversation-oriented communication increases, marital alienation decreases, leading to a reduction in emotional divorce.Similarly, conformity-oriented communication had a direct positive effect on emotional divorce (0.10), which was further exacerbated to 0.21 when marital alienation was included as a mediator. This suggested that marital alienation mediated the relationship between consensus-oriented communication and emotional divorce. Therefore, it can be predicted that as consensus-oriented communication increases, marital alienation also increases, increasing emotional divorce.

Overall, these findings highlighted the mediating role of marital alienation in predicting emotional divorce based on communication patterns among married female teachers in Darab. These results are consistent with previous research by Enayatpour (2016), Malekizade (2016), Hadian and Amini (2019), Poorhejazi (2021), Koerner and Fitzpatrick (2002), Pokorska (2013), Buser (2019), Yakobi (2021).

To explain these findings, it can be argued that family communication patterns, as the foundation of family interactions, significantly influence the functioning of family members in various aspects. Previous research has demonstrated that these impacts also extend to interpersonal relationships between spouses. Spousal communication patterns involve verbal and nonverbal interactions between husbands and wives (Parvandi et al., 2016). Families are characterized by a conversation-oriented communication pattern exhibiting frequent and spontaneous interactions among

members, open discussions on various topics, and collaborative decision-making. This open communication fosters stronger relationships and intimacy, enabling individuals to seek support and guidance from one another when facing challenges (Enayatpour, 2016). As a result, individuals in such families tend to possess greater intellectual independence and are more likely to resolve marital issues through open dialogue. This reduces the risk of marital alienation, often exacerbated by poor communication skills.

In contrast, families with a consensus-oriented communication pattern prioritize conformity in feedback, values, beliefs, and conflict avoidance (Koerner & Fitzpatrick, 2002). This can lead individuals who value consensus and rely on the approval of others to experience dissatisfaction with their relationships and gradually become alienated.

5. Conclusion

The findings of this study suggested that increased family communication patterns were associated with decreased marital dissatisfaction. This, in turn, contributes to better emotional regulation, reduced emotional and cognitive difficulties within relationships, and ultimately, lower levels of marital dissatisfaction and emotional divorce. Conversely, increased conformity within families is linked to higher levels of marital disillusionment, which over time can lead to psychological distress, emotional and cognitive turmoil, and ultimately, emotional divorce.

The research highlighted the negative correlation between family communication orientation and emotional divorce. Given that these communication patterns are often established during childhood and can significantly impact an individual's personality and adult relationships, it is recommended that parents, particularly mothers, receive training in effective communication strategies and implement them in their family lives.

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Conflicts of Interest

The Authors declare that there is no conflict of interest with any organization. Also, this research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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