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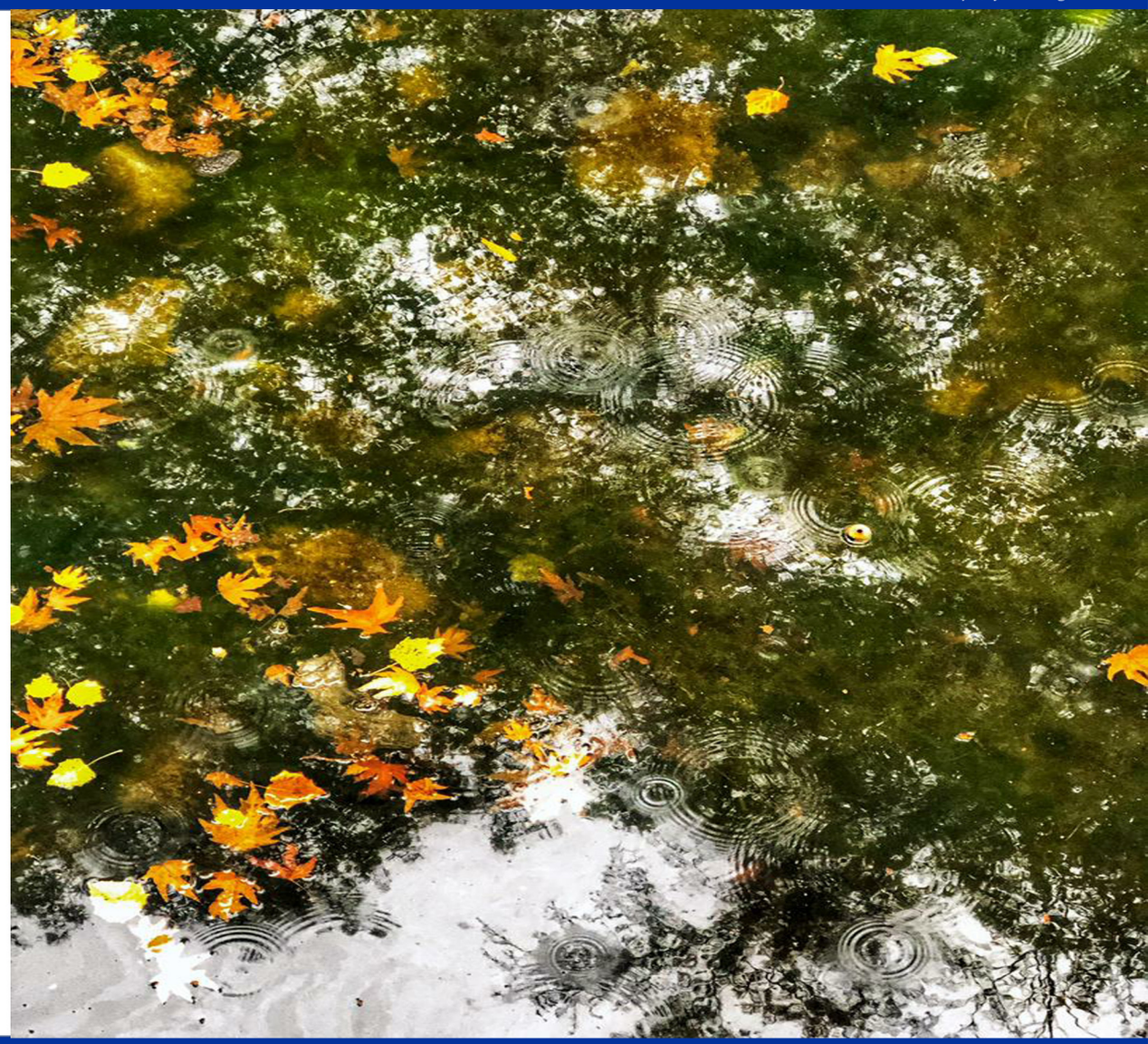

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International Journal of Body, Mind & Culture
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Information for Authors

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Comments on: The Effectiveness of Internet-Based Hope Therapy on Coping Strategies in Patients with Prostate Cancer

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Letter to editor

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Dear Sir,

I am writing this letter to give some comments on previously published article on the use of Internet-based hope therapy for the patients with prostate cancer (PC) (Abdulhasan, Abbas, Hamed, Al-Hili, Hamad, & Najm, 2022). The present article suggests the use of hope therapy for reducing stress and increasing effective coping strategies in the patients with PC. Hope is an important aspect and a determining factor, which correlates with various variables in one's life. In fact, it is the heart of various activities in human life. Moreover, it is the basic way to fight with the mental illnesses and prevent from them, while developing a personal quality of life, especially when one is in a critical situation, for example, suffering a poor prognostic physical disease such as cancer (Asiah, Rusmana, & Saripah, 2022). Therefore, it is worthwhile to select the patients with PC as the statistical population of the study.

Snyder's theory of hope is perhaps the most well-articulated contemporary hope theory and has received considerable attention in the last three decades (Asiah et al., 2022). His theory is about adolescents who are exposed to making important choices which may have an essential influence in their lives in future (Snyder, Feldman, Shorey, & Rand, 2002). One of the latest studies in this literature review shows that based on this theory, the strength-based counseling can increase students' hope during coronavirus disease-2019 (COVID-19) pandemic (Asiah et al., 2022).

The results showed that hope theory had been successfully applied in the therapeutic process whether individual or group-based. Hope, as defined in Snyder's hope theory, is the basis of various counseling approaches which are explored by the researchers, among which are the mental rehearsal strategies, hope-based interventions, self-management support interventions, art-based group intervention,

narrative photo-taking intervention, and miracle question (Asiah et al., 2022).

This study is worthy and has a lot of innovations as:

1- It is an Internet-based psychotherapy; therefore, it is very helpful during COVID-19 pandemic, when present meeting has a life threat for the patients with PC.

2- It was done in a short interval.

3- The method included a combination of offline and online approaches.

4- In this method, only one psychological intervention was used as a variable for the patients.

As I saw in summary of the reports on hope therapy sessions in table 1, it seems the title of hope therapy is not appropriate for this study, which is a brief Internet-based cognitive behavioral therapy focused on hope interventions; therefore, I suggest to change the name of the intervention to determine the novelty and advantages of the study.

Conflict of Interests

Authors have no conflict of interests.

References

Abdulhasan, M. J., Abbas, N. F., Hamed, N. A., Al-Hili, A., Hamad, D. A., & Najm, A. S. (2022). The Effectiveness of Internet-Based Hope Therapy on Coping Strategies in Patients with Prostate Cancer. *Int J Body, Mind and Culture*, *9*(sp), 51-59.

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Snyder, C. R., Feldman, D. B., Shorey, H. S., & Rand, K. L. (2002). Hopeful choices: A school counselor's guide to hope theory. *Prof Sch Couns*, *5*(5), 298.

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Investigating the Effect of Smoking on the Incidence of Internal Diseases (A Review Paper)

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Review Article

Abstract

Background: According to World Health Organization (WHO) estimates, there are currently 1.1 billion tobacco smokers worldwide. This study follows the need for change in the increasing trend of lifestyle-related diseases and the lack of extensive studies on the pattern of smoking.

Methods: In the current study, an electronic database search was conducted to identify studies that examined the impact of smoking on internal diseases from the beginning of February 2018 to the end of December 2021. After eliminating numerous articles based on their titles and abstracts, 273 articles pertinent to the study's objectives were selected. Due to the inadequacy of the target audience and the inclusion and exclusion criteria, 239 of the remaining articles were eliminated. The 44 remaining articles were examined more closely.

Results: Each cigarette produces more than 7,000 chemicals. Many of these substances are toxic, and about 69 of them can cause cancer. For every 15 cigarettes you smoke, a mutation occurs in the body. Mutations are the cause of cancer. Studies have shown a clear relationship between dose and response, with a sharp increase in the risk of arterial disease in heavy smokers. In countries where approximately 30% of the population smokes, 50% of arterial disease can be attributed to smoking.

Conclusion: Smoking increases the risk of cardiovascular disease (CVD) and lung disease, and leads to an increased risk of lung, throat, stomach, and bladder cancer, and many other cancers. One of the most important organs in the body that can be disrupted by smoking is the heart.

Keywords: Smoking; Cardiovascular disease; Lung cancer

Citation: Iswanto AH, Fadhil AA, Islam MZ, Mohammed AK, Jalil AT, Khlaif AT, et al. **Investigating the Effect of Smoking on the Incidence of Internal Diseases (A Review Paper).** Int J Body Mind Culture 2022; 9(4): 259-70.

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Introduction

The issue of tobacco use is discussed as one of the major and increasing risk factors for diseases globally, especially in connection with non-communicable and chronic diseases such as respiratory diseases, cancer, and stroke. Together, these diseases account for 95% of about 60 million deaths and 44% of the total disease burden worldwide as of 2005. Tobacco is the world's leading cause of controllable death. In this regard, it is estimated that smoking causes 4.9 million deaths annually worldwide (Akhu-Zaheya & Shiyab, 2017). The World Health Organization (WHO) estimates that this number will rise to 10 million by 2030, and because half of the mentioned deaths occur in productive and middle-aged individuals, it can decrease the life expectancy of people aged 35-60 years by 20-30 years. Other estimates suggest that of the 3.2 billion smokers, millions will die within the next 45 years if there is no significant change in the current trend in tobacco use. Scientific evidence also indicates that smoking makes a smoker sick and that people living around the smoker are at risk. It is estimated that these people are 30% more likely to develop lung cancer than others. A study conducted in the United Kingdom estimated the death rate of people around smokers at more than 10 thousand a year (Mao, Huang, Wang, Wang, Li, & Yang, 2021). Moreover, smoking is the most important risk factor for preventable diseases and one of the important causes of premature death. It is estimated that, currently, 87% of deaths due to lung cancer and 85% of deaths due to obstructive pulmonary disease are caused by smoking. In addition to the lungs, smoking also affects the cardiovascular system, and 56% of deaths due to coronary artery disease (CAD) and 68% of deaths due to heart attack are also caused by smoking. It is noteworthy that many previous researches worldwide have reported that the prevalence of smoking is increasing in both sexes, especially among young people, i.e., the age of smoking is decreasing (Pinto, Pichon-Riviere, & Bardach, 2015).

Snow et al. (2019) showed that tobacco and substance use disorders affect high heart failure risk populations, including those of racial/ethnic minorities, lower socioeconomic status, younger age, and male sex. Enhanced screening for tobacco and substance use disorders in hospitalized heart failure patients may reveal opportunities for treatment and secondary prevention. Grender et al. (2021) showed that improving and expanding the implementation of evidence-based tobacco control policies at the most comprehensive level could significantly reduce the future incidence of lung cancer in Europe (Schwarz, Becker, Sahm, Horstkemper, Rousi, & Becker, 2017).

The present study follows the need for change in the increasing prevalence of lifestyle-related diseases, and the lack of extensive studies on the undesirable habit of smoking and lack of adequate epidemiological knowledge about it, especially about smoking patterns, because such studies help to identify the at-risk population, the trend of smoking in different age groups, and its adverse effects and provide the basis for targeted preventive planning at the level of primary health care.

Methods

A search of electronic databases was conducted in this review study to identify studies that examined the impact of smoking on internal diseases from the beginning of February 2018 to the beginning of December 2021. After removing many articles based on title and abstract, 273 articles were chosen that were relevant to the study's objectives. Due to the inadequacy of the target group and the inclusion and exclusion

criteria, 239 of the remaining articles were eliminated. Thus, 34 articles were scrutinized in greater depth.

These articles were found using the keywords the effect of tobacco and smoking on internal diseases and their exacerbation in the PubMed, ScienceDirect, and BioMed Central databases. The following individuals were included in the study: Interventional research Dissemination of electronic findings investigating the impact of smoking on internal diseases. Articles that only considered cigarette smoking were included in this study. The exclusion criteria included studies on the reduction of smoking through interventions regarding health behaviors in consumers and interventional studies on the reduction of smoking to prevent and reduce diseases like diabetes, asthma, depression, and others. To determine the quality of the articles in question, 2 researchers with no conflicts of interest and a common agreement and consensus on the inclusion and exclusion criteria reviewed the articles and eliminated those that did not meet these criteria.

Results

When an individual's blood sugar level rises above normal, he/she develops diabetes. The pancreas is an organ in the body that produces the hormone insulin, which helps the body produce glucose to reach the body's cells (Kwon, Yang, & Lee, 2013). When a person has diabetes, their body cannot produce enough insulin or use the insulin produced in the pancreas properly. Therefore, less glucose reaches the cells, and instead, this glucose accumulates in the blood, which causes diabetes. There are two types of diabetes, type 1 diabetes and type 2 diabetes (Grabowska, Targowski, & Jahnz-Rozyk, 2006). Type 2 diabetes is the most common type of diabetes in adults and is observed in 90% of people with diabetes (Kazemzadeh, Manzari, & Pouresmail, 2017). Smoking is one of the causes of diabetes, and causes type 2 diabetes. Smoking also increases the risk of diabetes itself. Smokers are about 30 to 40% more likely to develop type 2 diabetes (Huttunen, Heikkinen, & Syrjanen, 2011). Moreover, diabetics who smoke have more difficulty controlling their diabetes and insulin intake, and no matter what type of diabetes a person has, smoking exacerbates diabetes and makes it harder to control. Smoking in a diabetic causes heart and kidney problems, slowing of blood flow in the legs that can lead to infection and ulcers, and in turn, to amputation or amputation of the leg, retinopathy (a type of eye disease that causes blindness), peripheral neuropathy (damage to the nerves in the limbs that causes numbness, pain, weakness, etc.) (Morita, 2007).

Research has shown that one of the most dangerous harms of smoking for diabetics is that diabetics who smoke are more likely to die, and this is a very significant link between diabetes and smoking. The fact is that, in people with diabetes, the toxic chemical compounds in cigarettes attack blood vessels more than others. Smoking presents an extra risk for the development of vascular complications in these patients, contributing to increased cardiovascular morbidity and mortality. Studies show that diabetics find it difficult to quit smoking due to the high social and psychological stress they experience. Little research has been performed on the smoking of diabetics. In one part, the prevalence of smoking in diabetic patients was studied by analyzing previous documents. The prevalence of smoking in diabetics is significantly higher than the prevalence in the general public. Unfortunately, smoking is also common among younger diabetics, while this group contributes a great deal to their health by quitting smoking. Details are presented in tables 1 and 2.

Table 1. Prevalence of smoking in various groups of diabetic patients

Group	Number of patients	Number of smokers	Prevalence of smoking
IDDM And NIDDM patients	13940	4542	33
< 30 years	183	51	28
≥30 years	808	260	32
Men	4140	1897	46
Men < 30 years	63	20	32
Men ≥ 30 years	356	142	40
Women	4482	1106	25
Women < 30 years	43	24	56
Women ≥ 30 years	452	118	26
IDDM patients	4264	1769	41
Men	1578	789	50
Women	1414	524	37

IDDM: Insulin-dependent diabetes mellitus; NIDDM: Non-insulin-dependent diabetes mellitus

The assessment of the molecular and biochemical composition of saliva and the study of structural and functional changes in its compounds due to various factors such as cigarette smoke can be very important and can be used in the prevention, diagnosis, and treatment of various oral diseases. Most of the biochemical compounds in saliva in terms of weight are proteins, which are mainly present in the form of glycoproteins. Alpha-amylase is one of the most important enzymatic compounds in saliva. The chemical compounds in cigarette smoke, including saturated and unsaturated aldehydes, can combine with enzymes and thiol-rich compounds and cause structural changes and changes in the function of various biochemical molecules in saliva. According to some studies, smoking and nicotine may reduce the activity of several enzymes, including alpha-amylase, in saliva. The response to treatment of oral diseases is somewhat different in smokers and non-smokers and, in some cases, a significant difference has been observed in the concentration of salivary biochemical compounds in these groups.

Side effects of smoking include damage to the heart and arteries. Smoking affects the arteries that carry blood to the heart and other parts of the body. Smoking reduces the amount of oxygen in the blood and causes damage to the walls of blood vessels. Smoking contributes to the development of atherosclerosis. Atherosclerosis occurs when blood vessels become narrowed and blocked. Finally, it reduces the amount of blood and oxygen in the body. The chemicals in tobacco smoke damage blood cells. Smoking can also damage heart function and the function and structure of blood vessels. It is obvious that, this damage increases the risk of atherosclerosis. Cardiovascular disease (CVD) occurs if plaque forms in the arteries of the heart. Over time, this condition can lead to heart failure, heart attack, arrhythmia, or even death. Smoking is a major risk factor for heart disease. The side effects of smoking and other risk factors such as poor health, high blood pressure, and overweight or obesity increase the risk of heart disease.

Smoking contains thousands of chemicals; the most important and harmful substances are nicotine and carbon monoxide. Nicotine is an addictive drug that affects brain and muscle activity and raises the blood pressure.

Table 2. Prevalence of smoking in the general population

Group	Number of patients	Number of smokers	Prevalence of smoking
Both men and women	64550	17594	27
Men	2651	1308	49
Women	3115	833	27

Carbon monoxide is a toxic gas that replaces oxygen in the blood and reduces the blood's ability to carry oxygen to the heart and other parts of the body (Smith & Fenske, 1996).

Any amount of smoking can damage the arteries of the heart. Smoking poses a greater risk to the heart and blood vessels in some people, such as women taking birth control pills and people with diabetes. Exposure to secondhand smoke can also damage the arteries of the heart. Cigarette smoke contains many harmful chemicals that greatly increase the risk of heart attack and death (Lippi & Henry, 2020). Cigarette smoke also increases the risk of heart disease in children and adolescents because it lowers high-density lipoprotein cholesterol in the blood, increases blood pressure, damages the tissues of the heart, and damages the lungs, especially in premature infants with respiratory distress syndrome (RDS) and asthma (Sales et al., 2019).

No matter how much or how long you smoke, it is in your best interest to quit. Quitting smoking reduces the risk of heart disease. Over time, the risk of developing atherosclerosis and blood clots also decreases. If you smoke and already have heart disease, quitting reduces the risk of sudden.

Some previous studies have investigated communities that have banned smoking in workplaces and public places (Bunch, 2022; Ni, Shi, & Qu, 2020; Santos et al., 2018). The results of these studies indicated that the number of heart attacks in these communities is very low. The researchers believe that these results are due to reduced smoking and reduced exposure to secondhand smoke. Among people with CVD, smoking cessation greatly reduces the risk of cardiovascular attack and cardiac death. In many researches, this risk reduction was 50% or more. The risk of developing atherosclerosis and smoking-related blood clots decreases after quitting. Quitting smoking can reduce your risk of heart disease by as much as or more than using commonly used medications, including aspirin, statins, beta-blockers, and ACE inhibitors (Lowe, Zein, Hatipoglu, & Attaway, 2021).

Smoke from cigarettes, hookahs, pipes, or any other type of tobacco can damage the body, but the damages to the lungs are much greater in people with asthma. Tobacco smoke is a strong stimulant for asthma symptoms. Smoking is an independent risk factor for pulmonary tuberculosis. Most studies have shown the effect of smoking on the weakening of the body's defenses. Smoking disrupts the function of alveolar macrophages and stimulates them to trigger a local inflammatory response. Nicotine suppresses the supply of antigens which produce a specific immune response. As a result, specific defenses of the body are disrupted (Gaur, Kasliwal, & Gupta, 2012).

When a person inhales cigarette smoke in any way, irritants are absorbed through the moist airway. These substances can lead to an asthma attack in people with asthma. In addition, cigarette smoke damages small tissues that look like hair and are called eyelashes. Typically, cilia expel dust and mucus from the airways. Tobacco smoke damages these lashes and reduces their efficiency, thus causing dust and mucus to accumulate in the airways. Smoke also causes the lungs to produce more mucus than usual. As a result, the accumulation of this mucus in the airways can trigger an asthma attack.

A person who does not smoke, but inhales environmental tobacco smoke (ETS) takes two types of smoke into their lungs, the smoke from burning smoking and the smoke emitted by the smoker. Inhaling secondhand smoke, commonly referred to as "passive smoke," may be more dangerous than smoking. This is because the smoke from the burning end of a cigarette contains substances such as tar, carbon monoxide, and nicotine, and is more dangerous than the smoke that the smoker himself inhales.

Cigarette smoke is especially dangerous for people with asthma. A person with asthma who is exposed to secondhand smoke is more likely to experience symptoms such as wheezing, coughing, and shortness of breath.

One of the reasons for the increase in cancer is smoking. Smoking cigarettes and hookahs causes various cancers in the body that are often irreversible. Not smoking is the greatest factor in the prevention of various cancers. The chemicals in cigarette smoke enter the bloodstream and can then affect the whole body, which is why smoking causes a variety of cancers (Takase et al., 2021).

Research shows that for every 15 smokers who smoke, a change in a person's DNA can cause a cancer cell to grow in the body (Sarthak, 2020). The best way to reduce your risk of cancer is to quit smoking altogether. The link between smoking and cancer is well known, and research suggests that smoking can cause at least 15 types of cancer. Cancers caused by smoking in the body are very sensitive and dangerous. Lung cancer is one of the cancers that can be caused by smoking and can affect a person (Miyazaki et al., 2022). Smoking causes other cancers in the body, including oral cancer, throat cancer, upper throat cancer, cancer of the nose and sinuses, throat cancer, cancer of the esophagus, and liver, pancreas, stomach, kidney, bowel, ovarian, bladder, and cervical cancer, and some blood cancers (Girkantaite & Andrejevaite, 2019).

Some of the harmful chemicals in tobacco smoke damage DNA. DNA is present in all cells of the body and controls how cells behave. If DNA is damaged, it can adversely affect cells and cause overgrowth as well as excessive division of the damaged cells. The chromium in tobacco smoke can attach harmful chemicals to DNA. This makes it easier for damaged cells to turn into cancer cells (Arpacioglu, Unubol, Erzincan, & Bilici, 2019). Moreover, the chemicals in tobacco smoke damage the immune system, which is responsible for eliminating toxins, which is why smokers are less able to eliminate toxic chemicals than other people. Toxins in cigarette smoke can weaken a person's immune system and make it harder to kill cancer cells (Palmer et al., 2018). When this happens, cancer cells grow without stopping. It is generally reported that 9 out of 10 lung cancers are caused by smoking or exposure to secondhand smoke. Although there are various treatments for lung cancer, it can be said that this type of cancer is the most important cause of death due to cancer (Wang, Ji, & Rahman, 2021).

Cigarette smoke contains harmful chemicals that can be harmful to both smokers and non-smokers. Breathing even a small amount of tobacco smoke can be very dangerous. There are more than 7,000 chemicals in tobacco smoke, at least 250 of which are harmful, including hydrogen cyanide, carbon monoxide, and ammonia.

Smoking is a very important factor in the incidence and acceleration of osteoporosis in smokers and non-smokers exposed to secondhand smoke. Osteoporosis is a disease that weakens bones and increases the risk of bone fractures. The severity of this disease is directly related to aging and is more common in women than men. There are several reasons why smoking is bad for your bones. Smoking increases the concentration of blood calcium in the body, and changes its absorption and storage in the bones by altering the permeability of cell membranes. Older people who smoke are 40-30% more likely to have a pelvic fracture than their non-smoking peers. Smoking reduces blood flow to the bones (Guo, 2020). Cigarette nicotine reduces the activity of bone marrow cells. Smoking reduces the absorption of calcium from food. Smoking lowers estrogen in women (estrogen causes strong bones in women). The rupture of the rotator cuff in the shoulder of smokers is almost twice as large as that of non-smokers. This is because tendons in smokers lose their

quality. Smokers are one and a half times more likely than non-smokers to have bursitis and tendonitis around the joints (Gallus, Lugo, & Gorini, 2020).

Discussion

Smoking can lead to infertility in both men and women. Erectile dysfunction in men and pregnancy complications also increase with smoking. Chemicals (such as nicotine, cyanide, and carbon monoxide) in cigarette smoke accelerate the destruction of eggs. Unfortunately, once the eggs are destroyed, they cannot be reproduced or replaced. This means that menopause occurs 1 to 4 years earlier in women smokers compared to non-smokers. In men who smoke, smoking is associated with a decrease in sperm count, low sperm motility, and an increase in abnormal sperm count, reduced sperm quality.

The fertility of women smokers is lower than that of non-smokers, so that the infertility rate of women and men smokers is almost twice that of non-smokers. The risk of fertility problems increases with the number of daily smoking sessions. Assisted reproductive therapies such as IVF may be effective in reducing the effects of smoking on fertility (Zheng, Ji, Dong, & Chang, 2018). Women who smoke need more ovarian stimulants during IVF, but they still have fewer eggs during ovulation and are 30% less likely to become pregnant than IVF patients who do not smoke (Mazıcan & Yarar, 2018). As smoking damages eggs and sperm, abortions and birth defects are more common in the fetuses of smokers. Even smokeless tobacco can increase the rate of miscarriage. The prevalence of chromosomal abnormalities such as Down syndrome is higher in women who smoke than in non-smoking mothers. In women smokers, the rate of ectopic pregnancy and preterm delivery is also higher (Ramotowski, Gurbel, Tantry, & Budaj, 2019).

Studies have shown that men whose mothers smoked half a pack (or more) a day had lower sperm counts. In addition, smoking during pregnancy can lead to fetal growth retardation and being underweight before birth. These children are at greater risk of lifelong medical problems (such as diabetes, obesity, and CVD). Children whose parents smoke are at higher risk of sudden infant death syndrome and asthma (Krzyścin, Napierała, Bręborowicz, Florek, & Sowińska-Przepiera, 2022).

The toxins in nicotine smoke cause the breakdown of auditory hair cells and disrupt the blood supply to the inner ear, resulting in hearing loss and hearing loss. Furthermore, due to the reduction in blood oxygen due to nicotine and carbon dioxide, the function of the auditory system is impaired. Researchers have found that the risk of hearing loss among smokers is about 70% higher than other people. Studies also show that exposure to secondhand smoke increases the risk of ear infections. Exposure to secondhand smoke causes fluid buildup in the middle ear, recurrent infections, and hearing loss (Russo et al., 2022).

Currently, smoking is thought to pose a separate risk called Epstein-Barr virus (EBV), which interacts with this factor, almost doubling the risk of developing non-steroidal anti-inflammatory drugs (NSAIDs). There is a direct relationship between consumption and the incidence of inflammation; people who have smoked for 25 years or more are at a higher risk of developing MS than people who have never smoked (Ahmed et al., 2021). In addition to setting the stage for these cancers, smoking causes a more severe secondary progression of MS by altering the relapsing-remitting period (Babinets & Kvasnitska, 2019).

The more a person smokes, the greater is the brain damage seen on magnetic resonance imaging (MRI) in patients with inflammatory bowel disease (IBD). Disability

is also more common in smokers, but may be prevented, at least in part, by quitting. Smoking may also prevent the treatment of IBD because it increases the production of antibodies against the beta-interferon molecules used to treat the disease. Therefore, many epidemiological studies suggest that smoking is one of the main environmental factors in the development of IBD. The average interval between the onset of smoking and clinical IBD development is about 15 years (Wieczorek et al., 2022).

Nicotine is known to be an immunosuppressive agent and stimulates the glycoprotein in tobacco's immune system, which may explain the increase in autoimmune phenomena in smokers, such as rheumatoid arthritis, systemic lupus erythematosus (SLE), and Crohn's disease. Microcirculation is defined as the flow of blood that carries blood to smaller vessels within the body's tissues. Nicotine increases this flow in the brain and increases the likelihood of permeable solutions entering the blood-brain barrier. According to research, leakage in the blood-brain barrier is thought to be an important factor in the onset of inflammation (R. Wang et al., 2019).

Conclusion

Smoking is one of the most important modifiable health risk factors worldwide, causing significant mortality due to cardiovascular accidents and lung problems. A new US Department of Health report on smoking states that new research shows that smoking, in addition to what is thought to be the cause of more diseases, second, the risk of lung cancer due to the prevalence of smoking and other diseases such as type 2 diabetes, muscle wasting in old age, male sexual dysfunction, arthritis, and osteoarthritis play an important role. Smoking, while weakening the immune system, can exacerbate respiratory illnesses such as asthma, and in some cases, the fetus is affected by smoking. Today, the role of cigarettes in diseases such as lung cancer and heart failure has increased compared to the previous 50 years. According to experts, the reason for this is the change in the way of making cigarettes and materials in cigarettes. In the 50 years since the first reports on the dangers of smoking were published, awareness of its implications for public health and its detrimental effects on the human body has increased, but unfortunately, the necessary measures to reduce smoking have not been taken worldwide.

Conflict of Interests

Authors have no conflict of interests.

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Nocebo and Psychological Factors in Irritable Bowel Syndrome: A Scoping Review

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Review Article

Abstract

Background: There is considerable information about the interrelation of functional gastrointestinal disorders (FGIDs) and psychological disorders, called gut-brain interaction. Physiological and psychological variables have been linked with the etiology and severity of IBS. The nocebo effect (the opposite of placebo) is defined as increase in pain or other symptoms after use of an inactive or inert treatment/agent purported to increase pain or unpleasant symptoms. Some psychological mechanisms of nocebo include expectancies, conditioning, learning, memory, motivation, somatic focus, reward, anxiety, and meaning. Moreover, neurobiological factors are associated with the etiology of this phenomenon. The aim of present study is a discussion of the definition, existence, prevalence, etiology, and characteristics of the nocebo effect in irritable bowel syndrome (IBS).

Methods: This paper presents a scoping review of the existence, frequency, and importance of the nocebo effect in IBS patients. Data sources included PubMed, PsycINFO, Google Scholar, and Scopus which were searched from their inception dates to 2022.

Results: The review of the obtained articles showed that psychological factors such as depression, anxiety, psychological distress, and some personality traits such as neuroticism are related to the occurrence of nocebo responses in IBS patients.

Conclusion: The psychological factors associated with nocebo responses include expectancies, conditioning, learning, memory, patient's personality. Moreover, societal factors and the quality of the patient-physician interaction, and neurobiological factors influence the process of diagnosis, course, and treatment of IBS through nocebo responses. Compared to the extensive research data related to the placebo effect, there is

little information and few articles on the role of nocebo, especially in FGIDs. This paper summarizes the scope and importance of the nocebo effect and IBS and its interrelations with psychological factors like personality, anxiety, depression, and psychological distress.
Keywords: Nocebo; Irritable bowel syndrome; Personality; Anxiety; Depression

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Introduction

Hippocrates said: "All disease begins in the gut."

Irritable bowel syndrome (IBS), a common functional gastrointestinal disorder (FGID), is characterized by recurrent abdominal pain, discomfort, and alterations in bowel habits that are not explained by structural or biochemical abnormalities that include the coexistence of bloating, flatulence, and abdominal distention (Yan et al., 2021). According to the symptom-based Rome IV diagnostic criteria, IBS can be subtyped into the four categories of constipation dominant (IBS-C), diarrhea dominant (IBS-D), mixed IBS (IBS-M), and unclassified (IBS-U) (Drossman & Tack, 2022). Following the introduction of the Rome IV criteria in 2016, the prevalence of IBS was reported to be 4-5% in the general population. Studies showed that 4.7% of adults in the United States, 4.6% in the United Kingdom, and 4.5% in Canada suffered from IBS (Palsson, Whitehead, Tornblom, Sperber, & Simren, 2020). According to a population-based, cross-sectional survey, 7.9% of Australian adults have a self-reported medical diagnosis of IBS (Stocks, Gonzalez-Chica, & Hay, 2019). According to the 18 epidemiological studies that were included in a systematic review, the prevalence of IBS in Iran varied from 1.1% to 25% (Jahangiri, Jazi, Keshteli, Sadeghpour, Amini, & Adibi, 2012). Although the etiology of IBS remains unclear, emerging evidence indicates that IBS is one of the disorders of gut-brain interaction (DGBI) (Ishiguchi, Itoh, & Ichinose, 2003; Carco, Young, Gearry, Talley, McNabb, & Roy, 2020), meaning it engages in homeostasis regulation via the gut-brain-microbiome axis (Pigrau et al., 2016; Person & Keefer, 2021). According to the biopsychosocial model of IBS, disturbance in intestinal motility and enhanced visceral sensitivity interact with other factors (Spiller et al., 2007; Flik, Bakker, Laan, van Rood, Smout, & de Wit, 2017). Moreover, psychological and social factors can influence digestive function, symptom perception, illness behavior, and outcome (Longstreth, Thompson, Chey, Houghton, Mearin, & Spiller, 2006). Research to date suggests that 44% of IBS patients have accompanying psychological disorders including depression and anxiety, and 37.6% of IBS patients have reported sleep problems, such as sleep fragmentation, poor sleep quality, and reduced sleep duration (Yan et al., 2021).

Because of the limited effect of pharmacotherapy, there has been increasing interest in psychological treatments for IBS (Longstreth et al., 2006). Any pharmacological or non-pharmacological treatment has two components, one related to the specific effects of the treatment itself and the other, nonspecific, related to the perception that the therapy is being administered (Colloca & Benedetti, 2005). The nonspecific effects of a treatment are called placebo effects when they are beneficial and nocebo effects when they are harmful (Benedetti, 1996; Aslaksen & Lyby, 2015). Placebo and nocebo response include all health changes observed after the administration of an inactive treatment (i.e., differences in symptoms after treatment compared to before treatment); thus, including natural history and regression to the mean (Enck & Klosterhalfen, 2021). The underpinnings of placebo and nocebo are psychological and neurobiological. Psychological mechanisms include expectations, conditioning, learning, memory, motivation, somatic focus, reward, anxiety reduction, meaning (Chavarria et al., 2017), and neurobiological factors, such as cholecystokinergic hyperactivity (Benedetti & Shaibani, 2018). Expectations have a strong influence on health outcomes (Petrie & Rief, 2019). Expectation facilitates the perception of a specific sensation and of stimulus categories; thus, this effect helps

clarify why side effects often occur as a cluster of multiple symptoms. Placebo and nocebo responses are mediated by expectations, associative and social observational learning processes, patient's personality, societal factors, and the quality of the patient-physician interaction (Benedetti, Lanotte, Lopiano, & Colloca, 2007; Schedlowski, Enck, Rief, & Bingel, 2015). In addition, a high somatic focus (Adibi et al., 2012), and the presence of certain psychological states like depression or anxiety and personality traits such as pessimism (Schedlowski et al., 2015) or neuroticism have been associated with the occurrence of nocebo effects (Planes, Villier, & Mallaret, 2016). The consequences of the nocebo effect in clinical practice are always undesirable. It may make therapeutic interventions more painful, reduce response to treatment, worsen symptoms, or lead to adverse events, in turn causing therapeutic non-compliance, non-adherence, or discontinuation of treatment (Blasini, Corsi, Klinger, & Colloca, 2017).

Methods

Data sources: In order to provide the available evidence of the nocebo phenomenon and IBS and to guide further research, we started to review the scope (Arksey & O'Malley, 2005). Unlike traditional systematic reviews, the purpose of the present study was to provide a preliminary assessment of existing research or ongoing studies, and to identify potentially important research areas. We kept our search broad due to the lack of information on the extent of the nocebo phenomenon and FGIDs in the literature. We searched four databases (PubMed, PsycINFO, Google Scholar, and Scopus) for primary studies from their respective inception dates to June 2022.

Search terms: We started a preliminary search of these databases to identify papers and establish terms that may refer to nocebo, psychological factors, and IBS. This search showed that few publications use 'nocebo, psychological factors, and IBS' anywhere in the article; some databases had no or very few publications in which these terms were used. We found no established search strings for identifying nocebo, psychological factors, and IBS-related papers and no alternative MESH phrases. Several papers used alternative phrases such as "negative placebo effects", "nocebo side effect", "adverse effects of placebo" and "side effects of placebo", and FGID. Since the word "placebo" is commonly used in clinical trials, using it would make the subject of study weak and disproportionate. We tried to limit the search terms to "nocebo", "psychological factors" with IBS, and one specific alternative term - 'negative placebo effects'. The reference lists of the included articles were searched for relevant studies. The inclusion and exclusion criteria are presented in table 1.

Table 1. Study selection criteria

Inclusion criteria	Exclusion criteria
1- Empirical articles • The prevalence of nocebo effect and IBS • Demographic characteristics related to the nocebo effect and IBS • The neurophysiological basis of the nocebo effect and IBS • The psychological basis of the nocebo effect • Effect of nocebo on clinical presentation • Influence of healthcare provider-patient relationship on nocebo effect prevalence in patients • Effect of nocebo on adherence to therapy in IBS patients	1- Non-empirical articles, including audits, letters, opinions, and editorials 2- Empirical articles that only emphasize placebo 3- Nocebo articles related to conditions other than FGIDs 4 Studies not in English 5 Case histories

Selection criteria: Titles and abstracts of all studies were reviewed considering the inclusion and exclusion criteria. Full texts of all articles that either clearly met or possibly met the inclusion criteria were obtained. The obtained articles were reviewed. The differences in the articles were examined and the data were extracted. The quality of the selected articles was evaluated using the five-step process proposed by Woods et al. (2005) (Table 2).

Results

Databases were searched from their inception to 2022. After the elimination of duplicates, we identified 176 potentially eligible studies (Figure 1). After applying the selection criteria to their abstracts, this number reduced to 14 articles. With 1 additional paper identified through the reference lists, 15 papers were included for full text reading. Subsequently, 7 studies were excluded as they did not include empirical evidence, frequency, or correlates, etc. of nocebo and IBS. This left 8 primary empirical studies which met the selection criteria (1 experimental study and 7 surveys). Finally, 8 studies provided data on the existence, incidence, psychosocial correlates, and underlying mechanisms of the nocebo effect and IBS, although there was substantial overlap between categories.

Definitions of nocebo: An original definition of nocebo effect is an adverse effect from an inert treatment. It seems that, the nocebo effect is complementary to the placebo effect, the beneficial health effect that occurs following an inert or inactive treatment (Lembo, 2020). In general, placebo has received more attention in researches than nocebo, although the nocebo effect has an arguably more important impact on medical and health care. The high rates of nocebo effects attached to medical treatments result in impaired quality of life for many patients and can cause significant issues in adherence and persistence with medical therapy that lead to increased medical costs. (Petrie & Rief, 2019). There is also evidence that the negative effects of a treatment reduce the effectiveness of future therapies (Kessner, Sprenger, Wrobel, Wiech, & Bingel, 2013). Few articles have attempted to define nocebo; however, some articles have defined it as 'I shall harm', which implies a kind of intentional action that can be challenging. Some other definitions emphasize the 'negative equivalent' of placebo, in their study equating to 'an increase in perceived pain due to negative expectations and/or previous learning'. It has also been defined as "adverse reactions experienced from taking a placebo" (Petrie & Rief, 2019). Liccardi et al. (2004) define it as "the onset of untoward reactions following the administration of an indifferent substance". However, the question remains whether a placebo is necessary to detect a nocebo effect or not.

Despite a growing number of relevant publications, the terminology associated with nocebo-related phenomena remains confusing. Nocebo effects may account for 38–100% of side effects reported in pharmacological trials, including serious adverse events (Nestoriuc, Pan, Kinitz, Weik, & Shedden-Mora, 2021).

Table 2. The five-step process of article quality evaluation

1) Are the aims and objectives of the research clearly stated?
2) Is the research design clearly specified and appropriate for the aims and objectives of the research?
3) Do the researchers provide a clear account of the process by which their findings were produced?
4) Do the researchers display enough data to support their interpretation and conclusions?
5) Is the method of analysis appropriate and adequately explicated?

Source: Woods et al. (2005)

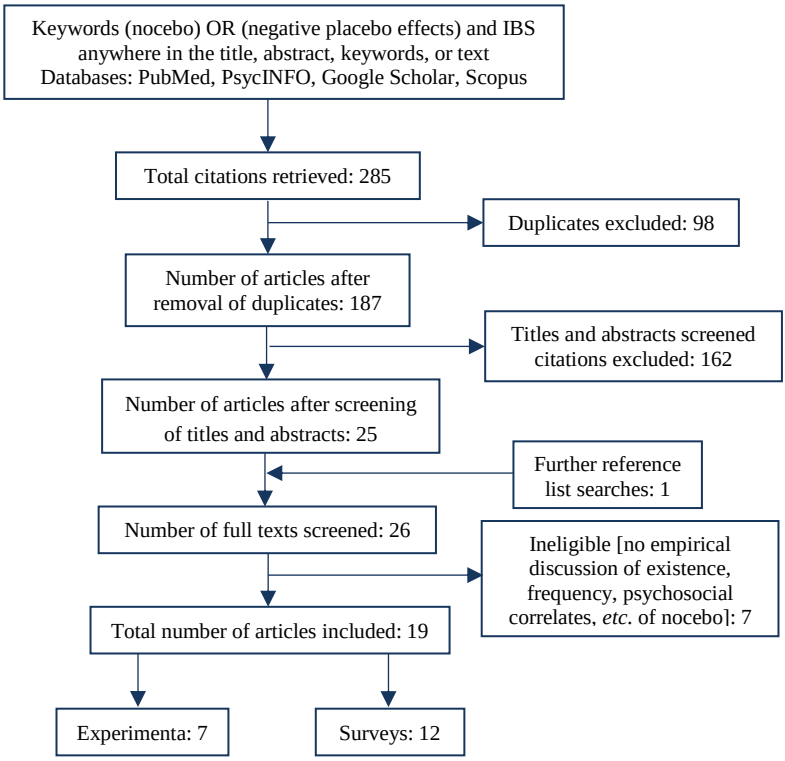

Figure 1. Summary of review process

Evidence for the existence and frequency of nocebo effect and psychological factors in IBS: Although there is no one widely accepted definition for nocebo, we identified significant empirical evidence from experimental and observational studies indicating that the nocebo effect/psychological factors in IBS is real, and potentially significant and important. For example, the study by Roderigo et al. (2017) supported the effects of acute psychological distress on placebo and nocebo responses in visceroception. Moreover, food intolerance in patients with non-gastrointestinal-related IBS can be an example of nocebo effect. For example, many patients describe symptoms akin to IBS, such as abdominal pain or discomfort, bloating, or altered bowel habits after eating. Notably, food intolerances can be associated with constipation as well as diarrhea. Patients may develop a myriad of non-gastrointestinal-related symptoms, such as brain fog, depression, joint pain, and skin rash. The nocebo response also plays a role in food intolerance in some patients (Chey, 2018). In another article of ours that is being published, the results showed a significant positive association between neuroticism score and nocebo effect among IBS patients. Lembo (2020) found that IBS patients with type A personality, who tend to have more neuroticism and pessimism, appear to have a higher nocebo response. In particular, anxiety, depression, and somatization are considered to be some of the psychological factors involved in the nocebo-related side effects in randomized clinical trials. A study indicated that individual factors like negative expectation and negative contextual factors can predispose individuals to psychological distress and the onset of the nocebo phenomenon (Amanzio, Howick, Bartoli, Cipriani, 2020).

Accurate and specific determination of the frequency and incidence of the nocebo effect, both in general and specifically in IBS, is difficult. Due to the lack of a clear definition for the nocebo phenomenon, we did not find a consistent methodology in studies related to the nocebo phenomenon. However, in various articles, the frequency of occurrence of nocebo effect, especially in IBS, has been reported. Regarding the frequency of the nocebo phenomenon, recent randomized controlled trials (RCTs) on adverse events in active treatment groups reported that approximately 70-80% of cases are probably not attributable to drug effects. Additionally, approximately 25% of patients randomized to placebo in clinical trials reported adverse events, and this prevalence increased significantly in studies when participants were asked about specific adverse events (Petrie & Rief, 2019).

Psychosocial correlates of nocebo: In the present study, the psychosocial correlates (both potential predictors/risk factors and sequelae) of nocebo in IBS patients were identified. These correlates included gender, prior experience or knowledge of harmful therapy, personality type, psychological variables (anxiety, depression, and distress), morbid conditions, and age. Many articles indicated that women were more likely to experience the nocebo effect. Strohle (2000) found that female patients with panic disorder had an increased nocebo response. The underlying causes of placebo and nocebo are psychological and neurobiological. Psychological underpinnings of placebo and nocebo effects include expectancies (positive or negative), conditioning (classical, instrumental, or observational), learning (with different approaches), memory, motivation, somatic focus, reward, anxiety, depression, and meaning (Chavarria et al., 2017). Negative expectations increase anxiety and intensify somatosensory information, thus intensifying the nocebo effect. Moreover, anxiety can be a key mechanism for the emergence of nocebo responses (McLemore et al., 2020). Other mechanisms may be involved in the induction of the nocebo response, including patient-related factors, psychosocial background, and neurobiological factors, such as cholecystokinergic hyperactivity. However, the most studied and understood mechanism is related to patients' negative expectations. Indeed, the task of the therapist in clinical practice is to maximize placebo effects while minimizing nocebo effects. However, in clinical trials, we want to minimize both placebo and nocebo effects (Benedetti & Shaibani, 2018).

Anxiety, depression, and psychological distress: In an RCT on pain perception, Staats, Staats, and Hekmat (2001) found significant correlations between anxiety and mood, and nocebo responses. Weimer, Enck, Dodd, and Colloca (2020) found that the nocebo response had a significant correlation with physical symptoms, state anxiety, negative mood, catastrophizing, and neuroticism. Researchers found a significant correlation between personality type A, which has a higher level of neuroticism and pessimism, and the presentation of nocebo responses (Lembo, 2020). In another study, the prevalence of anxiety was 45.67% in patients with IBS and 30.71% in the control group, which indicates a higher level of anxiety in IBS patients. Furthermore, as previously mentioned, the Prevalence of nocebo responses is higher in IBS patients (Mohammed, Moustafa, Nour-Eldein, & Saudi, 2021). According to a clinic-based study, the prevalence of depression and anxiety in IBS patients is 1.37%, and 31.4%, respectively. According to the results of this study, IBS-M is associated with a higher level of depression and anxiety, and the prevalence of depression and anxiety was the highest in IBS-C (Hu et al., 2021). Amanzio et al. (2020) found that people with anxiety, depression, and somatization are more likely to illustrate nocebo effects and responses. Anxiety, depression, and somatization are some of the psychological factors reported to

be involved in nocebo-related side effects in RCTs. Furthermore, the severity of psychopathology, such as the severity of anxiety and depression symptoms, significantly influenced the attribution of their bodily sensations to the drugs (Amanzio et al., 2020). It is interesting to note that most IBS patients with concomitant anxiety and depression present with gastrointestinal symptoms before the onset of psychiatric symptoms (Zhang et al., 2022). Patients with depression may be at risk due to obvious cognitive errors and frequent catastrophic thoughts, and hence, they are more likely to have negative expectations and show nocebo responses (Roderigo et al., 2017). There is, significant comorbidity (50-90%) among patients with functional GI conditions (disorders of brain-gut interaction) and psychiatric disorders (Montero & Jones, 2020). The disease burden of IBS is significant, IBS imposes a substantial economic burden in direct medical costs and in indirect social costs such as absenteeism from work and school, and lost productivity, along with the less-measurable costs of a decreased QOL (Hulisz, 2004). In fact, patients with chronic digestive disorders manifest higher rates of psychological distress, have lower QOL than the general population (Hauser, Janke, Klump, & Hinz, 2011), and some 38% even experience active suicidal ideation related to GI symptoms (Miller, Jones, & Whorwell, 2007). Research supports effective psychological treatments for varying GI disorders, with numerous RCTs demonstrating a marked reduction in GI symptoms, as well as an overall improvement in QOL and emotional well-being (Palsson & Whitehead, 2013). Understanding psycho-gastroenterology, including identifying appropriate patients for this service, can help increase patients' utilization of psychological treatments with the goal of reducing GI symptoms, improving overall emotional health, and ultimately decreasing the high health care costs of this population (Montero & Jones, 2020). According to the report of the American Gastroenterology Association (AGA), a detailed study showed that psychological distress aggravates digestive symptoms such as diarrhea and abdominal discomfort (Umrani, Jamshed, & Rizwan, 2021). The increase in abdominal pains both in terms of frequency and intensity of symptoms in patients with IBS based on the Rome criteria was associated with the presence of psychological distress symptoms (Shiha et al., 2021).

Personality traits: A review of personality studies shows that the personality traits of neuroticism, conscientiousness, and alexithymia are related to the occurrence of IBS (Muscatello, Bruno, Mento, Pandolfo, & Zoccali, 2016). Furthermore, studies have shown that nocebo responses have a significant relationship with personality type A and pessimism (Quilty, Sellbom, Tackett, & Bagby, 2009). It seems that some personality traits reduce individual risk and resilience and impact treatment responses in some psychological and psychosomatic disorders, such as major depressive disorder and bipolar mood disorder, which is associated with neuroticism/extroversion traits (Kelley et al., 2009). In addition, extraversion is associated with the occurrence of placebo responses in the context of empathy in patients with IBS (Beissner, Beissner, Brunner, Fink, Meissner, Kaptchuk, & Napadow, 2015). Moreover, Corsi and Colloca (2017) found that the personality trait of openness to experience plays no role in the placebo response; in addition, they found that personality trait alone did not have an effect on the nocebo response.

Biological and psychological mechanisms related to nocebo: Some studies have presented potential causes of nocebo. In a pain research, Benedetti, Amanzio, Vighetti, and Asteggiano (2006) found that nocebo hyperalgesia is verbally related to hypothalamus-pituitary adrenal axis hyperactivity. Moreover, other studies have suggested the role of dopamine (Scott, Stohler, Egnatuk, Wang, Koeppe, & Zubieta,

2008). Indeed, in some circumstances, a physiological effect (e.g., increased cortisol) may result from negative expectancy, even where nocebo is not ultimately evident in the results reported (Johansen, Brox, & Flaten, 2003). In addition, some studies emphasize the role of the hippocampus; nocebo hyperalgesia may be induced through a cognitive pain pathway (central pain system) and the hippocampus may play an important role in this process (Kong et al., 2008). Given other study evidence, the identification of cognitive pathways is not surprising. However, biological evidence can further support these findings. Moreover, cholecystokinin hyperactivity has also received much attention in this regard (Benedetti & Shaibani, 2018). The more specific psychological mechanisms involved in nocebo are the processes of learning and conditioning (i.e., the association of meaning and expectation through prior experience) (Klosterhalfen et al., 2009).

Discussion

According to the results of the present study, it is difficult to define the nocebo phenomenon; nevertheless, its identification is very important in clinical interventions as an important part of the effects of treatments can be negatively affected. The present study has provided good information while identifying the nocebo effect in IBS and the role of psychological factors in the creation, strengthening, and persistence of the nocebo effect. Researches have shown that the nocebo phenomenon is more common in women and its prevalence in clinical settings is 3-27%. Moreover, the results showed that some personality traits such as neuroticism, extroversion, conscientiousness, and type A personality are related to the occurrence of the nocebo phenomenon. However, psychological disorders are common in IBS, and can increase the occurrence of the nocebo phenomenon in these patients. As previously mentioned, the psychological and social correlates of the nocebo effect included type A personality (competitive, a sense of urgency, and tendency to hostility), pessimistic nature, and psychological disorders such as panic or depressive disorders. Biological and psychological mechanisms are the underlying causes of the nocebo effect with a major emphasis on prior experience or expectancy. Contrary to the results of other studies, van Laarhoven et al. (2011) did not find a relationship between neuroticism and the placebo and nocebo effects. Furthermore, Beedie, Foad, and Coleman (2008) observed a positive correlation between placebo trials and neuroticism. The existence of contradictory data in the studies related to placebo and nocebo motivates us to strengthen and increase the scope of our research in this regard. However, there is a controversial relationship between extraversion and the nocebo and placebo phenomena. Beedie et al. (2008) showed that more placebo effect is seen in people with extroverted characteristics. Amanzio et al. (2020) found that people with symptoms of depression and anxiety as well as somatization are more ready to provide nocebo responses and the level of psychopathology may be related to the occurrence of nocebo responses.

Strengths and limitations of the review: The present study provides a clearer picture of the nocebo phenomenon in clinical studies, and research related to functional gastrointestinal disorders and psychosomatic disorders in general. Furthermore, the lack of a precise definition or the variety of definitions for the nocebo phenomenon was a barrier to finding related articles. In addition, due to the specialization of the field of functional gastrointestinal disorders and its relationship with psychopathology and the nocebo phenomenon, there were very few related articles. However, this article provides an opportunity to further investigate this very

important and practical field.

Implications for practitioners: Although in some articles, the prevalence of nocebo responses was 3-27%, this rate can be higher in some disorders. A high level of nocebo reactions is observed in patients with functional gastrointestinal disorders, especially IBS. Therefore, experts' familiarity with the nocebo phenomenon and factors related to it can be effective in providing appropriate therapeutic interventions. It is important for practitioners such as physicians and clinical psychologists to identify those individuals most at risk of nocebo responses; not all risk factors will be as obvious as gender. This study identified neuroticism, anxiety, depression, psychological distress and panic disorder, and type A personality as nocebo predictors.

Conclusion

Research evidence shows that nocebo effects are both real and underlie an important part of the diagnosis and treatment process. However, they can cause disease complications, result in the patient's dissatisfaction with the treatment process, and also cause problems such as non-adherence to treatment or the occurrence of unusual reactions in the patient, and drug non-compliance. The results of studies on nocebo can assist therapists in the early identification of at-risk patients according to the identified risk factors for the occurrence of nocebo effects, such as personality traits, and clinical symptoms such as anxiety, depression, and pessimism, and the provision of appropriate interventions. These studies can reduce the cost of treatment and the burden of the disease while providing more satisfaction to the patient and the therapist.

Conflict of Interests

Authors have no conflict of interests.

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Assessing Treatment Personnel's Trauma Patient Management Skills at Emergency Centers in Baghdad, Iraq

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Quantitative Study

Abstract

Background: Trauma is one of the most significant problems and challenges of a contemporary and industrial culture that has been addressed in most nations. Due to the significance of pre-hospital care in the trauma treatment system, the current study was conducted with the aim to examine the impact of learning-based education based on a modified team.

Methods: From among the 207 emergency center personnel in Baghdad, stratified random sampling was used to select 140 to participate in a clinical trial. The participants were divided into intervention and control groups. The intervention group was trained in trauma management using a problem-based learning strategy, whereas the control group received no training. The data collection tools included a demographic information form and the Brief Trauma Questionnaire (BTQ). The SPSS software was used for data analysis.

Results: Multiple post-hoc comparisons showed that the mean score of trauma patient management skills did not significantly differ between the two groups during the pretest ($P = 0.918$). However, a statistically significant difference was seen between the two groups during the posttest and follow-up stages ($P < 0.001$). An analysis of variance revealed that the interaction effect of time and intervention on the mean score of trauma patient management skills was statistically significant ($P < 0.001$).

Conclusion: Finally, it is concluded that taking appropriate, accurate, and scientific measures will reduce mortality due to trauma and irreversible complications in the family and society.

Keywords: Problem-based learning; Trauma nursing; Emergency medical services; Management

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Introduction

In developed and developing nations, trauma is among the leading causes of death and disability. According to global studies, 10% of deaths worldwide are caused by trauma. Moreover, 90% of trauma-related deaths occur in low-income and middle-income countries, and the number of trauma-related deaths is expected to rise by 2030 (Awwad, Ng, Lee, Lim, & Rawajbeh, 2021). Society has incurred substantial economic and social costs as a result of trauma. In light of this, health care policymakers have taken fundamental steps to create care systems for these patients. Managing and caring for trauma patients with acutely life-threatening conditions is typically challenging and increases anxiety among the medical staff (Colonna et al., 2022; Hogan & Boone, 2008).

Today, the provision of health care and medical services is regarded as one of the indicators of a society's level of development (Howard & Dumond, 2015). One of the important pillars of care is the provision of pre-hospital care and services; these services are provided to trauma patients based on the clinical judgment and timing of emergency technicians (Mohammadi, Zargar, Malekpour, Omidi, & Akbari, 2018). Consequently, clinical decision-making is an important process, and the validity of clinical decisions depends on appropriate and reflective judgment (Balfour, Powell-Bowns, Leow, & Arthur, 2021). Previous researches have demonstrated that the failure of emergency technicians to make timely and accurate decisions endangers the community's health, prolongs the treatment and care of patients, and causes them problems (Yan, Slidell, & McQueen, 2021; Su, Kaplan, Burd, Winslow, Hargrove, & Waller, 2017).

Evidence shows that enhancing patient care can reduce trauma-related complications and mortality, and increase patient survival. Advanced trauma life support (ATLS) was first introduced in Nebraska in 1978 by the American College of Surgeons. It enhances physicians' professional knowledge and skills in caring for trauma patients (Rattan, Ravi, Rao, Kaur, Kant, & Misra, 2021). This method is a combination of lecture and clinical simulation that is widely used worldwide. One of its objectives is to increase knowledge of the trauma care system and foster critical thinking in decisions related to trauma patients. In many nations, this course is required for emergency medical personnel. Studies have demonstrated that careful care based on current ATLS global trauma standards improves treatment and reduces long-term disability and trauma-related mortality. ATLS is a formal training program for physicians and nurses to increase their knowledge of providing prompt and timely care to trauma patients (Laghari et al., 2021). Its purpose is to expedite emergency interventions for these patients within the first few hours of hospital admission to improve their recovery outcomes (Wentian, Baoliang, & Fritzsche, 2020). Considering the significance of emergency nurses' work with trauma patients and the prevalence of accidents, accidents, and natural and artificial disasters, the preparation of nurses for the provision of medical care is crucial. By increasing the preparedness of emergency nurses and providing better care to trauma patients, it is expected that the effects of trauma (Perry, 2008). Inadequate preparation of emergency department nurses affects the quality of care provided to patients and trauma victims. Lack of practice, knowledge, and relevant skills are the primary causes of emergency nurses' subpar performance in providing care to trauma patients (Brown, Tidwell, & Prest, 2022; Mohammad, Branicki, & Abu-Zidan, 2014).

The results of the study by Carley and Driscoll (2001) revealed that the care provided to trauma patients falls far short of the international standards. There are

concerns regarding all aspects of emergency care provided to trauma patients. Due to the lack of skills and knowledge of emergency nurses regarding the rapid treatment of life-threatening conditions, many preventable deaths occur. Some studies on this topic have acknowledged that most nurses have insufficient knowledge, competence, and experience to care for trauma patients, which may be due to a lack of accurate assessment of nurses' abilities and identification of their weaknesses. In the study by Sand (2019), nurses in rural hospitals in the United States were inadequately prepared and required training in various skills to care for emergency patients. A lack of clinical competence can result in poor performance in the care of trauma patients; thus, it is essential to assess the competence of nurses and identify their knowledge and skill gaps. Before caring for a trauma patient, nurses should be aware of their knowledge and skill gaps. With appropriate training, the most important aspect of caring for a trauma patient should be addressing these limitations.

Given the significance and magnitude of trauma and its harmful material and immaterial consequences for the individual and society, particularly in developing nations, it is crucial to implement effective interventions to prevent and reduce its complications (Jorgensen, Monrad-Hansen, Gaarder, & Naess, 2021). In addition, given the importance of pre-hospital care in providing services and transporting the injured, these measures can serve as a criterion for evaluating the skills of emergency medical personnel in dealing with the wounded (Ali, Sorvari, Camera, Kinach, Mohammed, & Pandya, 2013). Therefore, continuous evaluation of the competencies of emergency medical personnel is necessary. The performance appraisal compares the current situation to the desired or ideal circumstances based on predetermined indicators and characteristics. By evaluating the performance of human resources, individuals can receive appropriate feedback to enhance their performance, modify their occupational behaviors within the organization, and develop their expertise while correcting errors. A performance evaluation system is a tool for increasing and improving the quality and quantity of human resources as part of management oversight (Mitchnik & Rivkind, 2022; Mastrianni et al., 2021).

Furthermore, qualitative studies conducted in Iraq have underestimated the ability of emergency technicians to think critically and make clinical decisions, highlighting the significance of implementing methods that influence the critical thinking and clinical decision-making abilities of emergency technicians. Some studies indicate that ATLS training improves the treatment outcomes of trauma patients. Although trauma patient education is increasingly incorporated into the curricula of medical and nursing students, medical personnel's level of knowledge and practice in treating trauma patients is questionable. In light of the significance of correct clinical decision-making and its effects on trauma patients, this study was conducted with the aim to determine the impact of implementing the ATLS method on trauma patient management. This study evaluated the skills and knowledge of the emergency department staff of hospitals in Baghdad, Iraq, regarding trauma patients in order to evaluate the quality of care provided to these patients and education in this regard.

Methods

The current study was a clinical trial conducted on 140 emergency medical personnel in Baghdad beginning in 2019. The participants were selected via stratified random sampling proportional to each group's population proportion. The study enrolled 70 participants to calculate the sample size using formula 1 to compare the two means with 98% confidence interval (CI) and 90% power for each group.

$$n1 = n2 = \frac{\left(Z_{1-\alpha/2} + Z_{1-\beta}\right)^2 (S_1^2 + S_2^2)}{(\mu_1 - \mu_2)^2} \quad (1)$$

First, the list of personnel working in emergency medicine in Baghdad (207 individuals, including 74 nursing specialists, 29 anesthesiologists, 78 emergency medical specialists and experts, and 26 nursing diploma technicians) according to Graduated was stratified randomly. Then, the participants (140 individuals) were chosen randomly based on each group's population ratio (51 nursing experts, 18 anesthesiologists, 54 emergency medical experts and technicians, and 17 nursing diploma technicians). Subsequently, using a table of random numbers, the participants were assigned to the control and intervention groups through simple randomization. After identifying the members of the intervention group using a simple random sampling method, they were divided into 7 small groups. The 7-person groups were determined through a lottery. The demographic characteristics of the research groups are presented in table 1.

The study inclusion criteria included consent to participate in the study, a minimum education of a diploma in nursing related to emergency medicine, no history of attending team-based training workshops or working in the operations field, and an employment order. The exclusion criteria included unwillingness to participate in the study and absence of more than 3 hours from the workshop. Among the data collection instruments was a checklist of trauma patient management skills. The trauma patient management skills checklist for pre-hospital trauma care includes a trauma patient survey on 48 points. Each skill on the survey was given 1 point, and non-performance received no points (Quon, Riddell, Bench, Roepke, & Burner, 2022). It should be noted that 10 lecturers and experts from Diyala University, the Iraqi Medical Emergency and Accident Management Center, and the Baghdad Emergency Center reviewed and approved the formal and content validity of the tools. The reliability of the clinical skills checklist was assessed using the Kuder-Richardson criterion. The reliability coefficient for each of the competencies on this list was 0.83.

It is also important to note that the Brief Trauma Questionnaire (BTQ) was utilized in the study's continuation. The class dates were adjusted to accommodate shift schedules and participants' shifts to prevent shifts from interfering with training sessions. In the intervention group, trauma patient management training was administered in 3 stages using the ATBL method (Wise, Carpenter, Mohanty, Abdul, & Hughes, 2021).

Table 1. Comparison of frequency and demographic characteristics of research groups

Demographic characteristics		Intervention group		Control group	
		Number	Percentage	Number	Percentage
Gender	Male	31	44	27	39
	Female	39	56	43	61
Marital status	Single	16	23	12	17
	Married	54	77	58	83
Age (year)	< 35	21	30	19	27
	35-45	34	49	38	54
	45 ≥	15	21	13	19
Job rank	Nursing experts	25	36	26	37
	Anesthesiologists	9	13	9	13
	Emergency medical experts and technicians	27	38	27	39
	Nursing diploma technicians	9	13	8	11

The initial phase consisted of pre-class preparation. After the introductory session, the training method and educational objectives were described in detail. The staff was also briefed on the materials required for each training session based on the subject matter. The training materials included books, PowerPoint presentations, and videos. The second and third stages of the ATBL method were covered in the first and second training sessions a week after the introductory session (Kruse, Bruce, Bekker, & Clarke, 2021). The first 15 minutes of the second phase of each training session were devoted to evaluating the participants' readiness. At the beginning of the training session, the intervention group was given a readiness assessment consisting of 30 questions based on the educational content. This test took 20 minutes to complete. Then, the group readiness assurance test was administered in 20-minute increments with identical questions. After answering the questions, the instructor reviewed the responses and clarified several concepts that were not understood. The third and most important stage consisted of training in the practical management of trauma patients. Each group was tasked with introducing a patient to the topic's fundamental concepts and skills. Each group completed this task in 15 minutes. Then, the instructor requested that the teams demonstrate their abilities. Answers were presented in various ways, including on a patient, mannequin, or classroom board, and through presentation, discussion, and group feedback. Finally, the instructor reviewed each team's assignments and compiled the best answers and performances. The final 20 minutes of the third stage were devoted to staff training and troubleshooting. In accordance with the research objectives, members of the intervention group were instructed not to share any information with the control group or other personnel. The trauma patient management skills of both the intervention and control groups were evaluated 2 weeks and 2 months after the intervention. For statistical analysis, SPSS software (version 16; SPSS Inc., Chicago, IL, USA) was used. The Kolmogorov-Smirnov test was used to examine the data's normality. The data followed a normal distribution, so parametric tests were used for statistical analysis ($P > 0.05$). The means were compared before the intervention, and 2 weeks and 2 months after the intervention using a test of repeated measurements. Figure 1 depicts the study's steps in a schematic format.

Results

This study compared quantitative variables between groups using an independent t-test. There was no correlation between quantitative contextual variables and the study groups ($P > 0.05$). In terms of underlying quantitative variables, it can be concluded that the control and intervention groups are quantitatively equivalent. After the educational intervention, the mean scores of the trauma patient management skills increased in the intervention group. There was no difference between the mean pretest, posttest, and 2-month follow-up scores in the control group (Table 2).

The interaction effect of time and intervention on the mean score of trauma patient management skills was significant ($P < 0.001$), as indicated by the analysis of variance (ANOVA). The trend of variable response (skills in trauma patient management) over time differed between the 2 groups. Given that the significance level of the time variable is less than 0.05, the assumption that the various levels of the time factor are identical is false. Consequently, a statistically significant difference was observed in the mean trauma patient management skills scores at various times ($P < 0.001$).

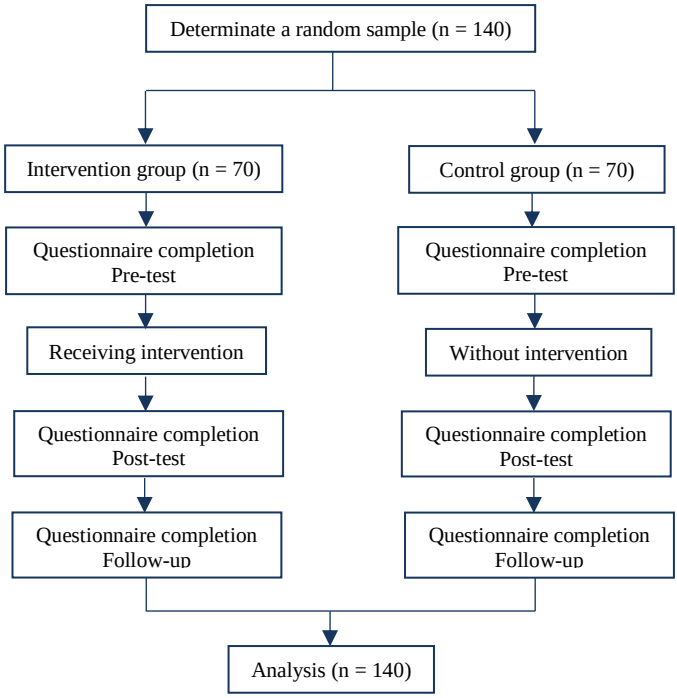

Figure 1. Different steps of the present study
Pre-test: Before intervention; Post-test: Two Week after intervention; Follow-up: Two months after intervention

Regarding the intervention's main effect, the ANOVA table reveals a statistically significant difference between the intervention and control groups in the trend of the mean score of trauma patient management skills ($P < 0.001$). (Table 3).

Multiple post hoc comparisons revealed that, prior to the intervention, the mean score of trauma patient management skills did not differ significantly between the two groups ($P = 0.918$), indicating that, prior to the research, the two groups' trauma patient treatment skills were comparable. Table 4 reveals a significant difference between the two groups' mean scores on the trauma patient management skills test 2 weeks and 2 months after the intervention.

Multiple comparisons between the mean scores of trauma patient management skills in the control and intervention groups revealed a significant difference between the intervention group's pre-intervention and post-intervention scores. Moreover, the mean scores of trauma patient management skills were significantly different 2 weeks and 2 months after the intervention ($P < 0.05$).

Table 2. Mean and standard deviation of trauma patient management skills score in the intervention and control groups before and after training

Time	State	Intervention group (mean ± SD)	Control group (mean ± SD)
Before intervention	Pretest	26.71 ± 4.13	26.93 ± 3.43
Two weeks after the intervention	Posttest	35.63 ± 3.57	26.14 ± 4.17
Two months after the intervention	Follow-up	34.19 ± 3.72	26.73 ± 3.27

SD: Standard deviation

Table 3. Comparison of pretest, posttest, and follow-up of trauma patient management skills in the intervention and control groups using analysis of variance

Trauma patient management	Total squares	Average squares	Degrees of freedom	P-value
Main effect (time)	612.43	612.43	1	< 0.001
Main effect (intervention)	1973.12	1973.12	1	< 0.001
Reaction (with intervention)	738.92	738.92	1	< 0.001
Error component (time)	253.67	2.73	89	0.590
Error component (intervention)	3015.17	27.64	89	0.410

After the intervention, the score of trauma patient management skills increased significantly. Furthermore, in the control group, the mean scores of trauma patient management prior to, 2 weeks after, and 2 months after the intervention did not differ significantly (Table 5).

Discussion

The researchers aimed to look into the impact of trauma patient management training based on a modified team-based learning method on emergency center personnel in Baghdad in 2019. As the first line of treatment for trauma patients, physicians should be able to control and manage the critical situation that arises when dealing with these patients. Consequently, emergency rooms and medical centers should have a formalized training program. Moreover, given that one of the objectives of ATLS is to teach patients rescue skills in critical and stressful trauma situations, it seems that a more concerted and formal effort should be made to provide such training across disciplines. Among them are the medical and other related fields, including the nursing care of trauma patients in primary care centers.

Before the intervention, there was no statistically significant difference between the two groups regarding the mean score of trauma patient management skills. In comparison, this difference was statistically significant after the intervention. In other words, the group that participated in the educational intervention based on the modified team-based learning had a higher mean score of trauma patient management skills than the control group. Training emergency medical personnel in a group setting is more effective. In this study, the posttest was administered 2 weeks after the intervention, and the follow-up was 2 months after the intervention without the participant's knowledge. A lack of study time may have been a result of this situation. ATBL's ability to thrive can be attributed to its high posttest scores. This finding is consistent with that of other researches indicating that learning is better retained for a longer time following ATBL.

Williams, Lockey, and Culshaw (1997) demonstrated that even condensed training could significantly improve staff and student performance in dealing with a simulated trauma patient. Such training must be conducted with extreme caution. Jayaraman, Sethi, and Wong (2014) examined ATLS skills training in individuals other than physicians and nurses, i.e., dispatch ambulance teams, and found no advantage to ATLS training for these teams.

Table 4. Investigating the difference in the mean of trauma patient management skills between the study groups using post hoc method

Time	State	Group	Difference of mean ± SD	Adjusted P-value
Before intervention	Pretest	Intervention-Control	-0.22 ± 0.54	0.918
Two weeks after the intervention	Posttest	Intervention-Control	9.49 ± 0.67	< 0.001
Two months after the intervention	Follow-up	Intervention-Control	7.46 ± 0.36	< 0.001

SD: Standard deviation

Table 5. Investigating the difference in the mean of trauma patient management skills within the groups using post hoc method

Group	Comparison	Difference of mean ± SD	Adjusted P-value
Intervention	Pretest vs. Posttest	-8.92 ± 0.47	< 0.05
	Pretest vs. Follow-up	-7.45 ± 0.51	< 0.05
	Posttest vs. Follow-up	1.44 ± 0.37	< 0.05
Control	Pretest vs. Posttest	0.79 ± 0.39	0.83
	Pretest vs. Follow-up	0.2 ± 0.23	0.49
	Posttest vs. Follow-up	-0.59 ± 0.48	0.76

SD: Standard deviation

In addition, they concluded from an analysis that mortality increased in patients with a Glasgow Coma Scale (GCS) score of less than 9 who received ambulance care from personnel who had received ATLS training. According to the study by Alwawi, Amro, and Inkaya (2019), training nurses in trauma patient care based on the ATLS protocol increased their awareness and abilities to provide the best care to trauma patients worldwide, particularly in developing countries. Due to a lack of nursing education, this issue is less prevalent in developing countries. In a study by Studnek, Fernandez, Shimberg, Garifo, and Correll (2011) in the United States, titled "the relationship between performance in the medical emergency services scene using simulated stations and theory test," 96% of the 133 participants passed the practical exam. In a study conducted in Sweden, Lampi, Junker, Berggren, Jonson, and Vikstrom (2017) found that clinical decision variables improved significantly after implementing a life-saving exercise program. The findings of the study conducted by Baird, Kernohan, and Coates (2004) indicate that this exercise program positively impacts the performance and clinical decision-making of emergency department nurses after its implementation. In terms of the effectiveness of the educational intervention in enhancing clinical decision-making, it can be concluded that these studies support the findings of the present study.

The current study revealed that most of the emergency personnel in Baghdad are competent in caring for trauma victims in pre-hospital settings. Since some scores were significantly lower than the desired level, it is important to draw attention to them. In addition, the repetition and practice of practical skills, relevant training in this area, and additional workshops and training for emergency personnel are necessary in Baghdad to improve personnel's knowledge and skills. Given that attempting to save a trauma patient is one of the fundamental skills that medical personnel must acquire and that these skills and knowledge evolve, such training should be formally incorporated into the student education program and repeated in the form of refresher training. Depending on the readiness of medical staff to care for trauma patients, strengths and weaknesses of staff, and related demographic and organizational factors, managers of medical and nursing services can design and implement comprehensive training programs based on ATLS to strengthen the weaknesses of emergency personnel. Moreover, they must examine the effects of this training on the quality of care, patient safety, patient and family satisfaction, and the degree of disability and mortality among trauma patients.

The present study's limitations include a simple and accessible sampling technique and data collection via a self-report questionnaire. Different medical management positions, including nursing experts, anesthesiologists, emergency medical experts and technicians, nursing diploma technicians, and appropriate and local tools in the preparation field following ATLS guidelines are other limitations of

this study. In addition, the present study's strength lies in the improvement of learning and retention of the material 2 months after the intervention, which resulted in a significant rise in trauma patient management scores. It also resulted in the significant survival of course material.

Conclusion

In conclusion, the present study's findings demonstrate a correlation between trauma management program training and the improvement of emergency personnel's abilities and decision-making skills in the management of trauma patients. As a result, the pre-hospital emergency trauma management training program can be integrated into the emergency medical technician training program and regularly used as an on-the-job retraining program. Given the significance of clinical decision-making in pre-hospital emergencies, determining the level of appropriate clinical decision-making skills can be considered a requirement for hiring technicians. Determining the ideal level of clinical decision-making skills can be the subject of additional study. Clinicians should get regular retraining to keep their decision-making skills up to date and make sure they are making good clinical decisions. Based on the content of the trauma management program, it appears that this program effectively establishes a unified procedure in the principles of dealing with a trauma patient using a systematic approach by emergency medical technicians. In addition, it is suggested that qualitative research be conducted on nurses' perspectives regarding barriers to and facilitators of the quality of nursing care for trauma patients.

Conflict of Interests

Authors have no conflict of interests.

Acknowledgments

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Designing and Validating a Structural Model for Academic Engagement based on Personal, Family, Peer, and Educational Factors with the Mediating Role of Academic Buoyancy in University Students

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Quantitative Study

Abstract

Background: The aim of this study was to design and validate a structural model for academic engagement based on personal, family, peer, and educational factors with the mediation role of academic buoyancy in university students.

Methods: This study was a correlational research based on structural equation modeling. The statistical population included all students of Esfarayn University (Iran). In this research, 304 students (253 boys and 51 girls) were selected as the participants using random cluster sampling. The Academic Engagement Scale (Fredericks, Blumenfild, & Paris, 2004), Academic Buoyancy Scale (Dehghanizade & Hosseinchari, 2012), Academic Self-efficacy Scale (Owen & Feraman, 1998), Help-seeking Questionnaire (Ryan & Pintrich, 1997), Multidimensional Scale of Perceived Social Support (Zimet, Dahlem, Zimet, & Farley, 1988), Perceived Parenting Style Questionnaire (Baumrind, 1967), Transformational Teaching Questionnaire (TTQ) (Beauchamp et al., 2010), and Perception of Classroom Structure Questionnaire (Blackburn, 1998) were used to measure the variables under study. The significance level in this study was considered to be 0.05. The data analyses were performed using SPSS software.

Results: Data analysis showed that academic self-efficacy, acceptance of help-seeking, perceived social support, authoritative and permissive parenting styles, perception of classroom structure, and transformational teaching have a direct effect on academic engagement ($P < 0.01$). Furthermore, academic self-efficacy, acceptance of help-seeking, perceived social support, authoritative and permissive parenting styles, perception of classroom structure, and transformational teaching have indirect effects through academic buoyancy on academic engagement ($P < 0.01$).

Conclusion: In total, the research variables were able to predict about 55% of the variance of academic engagement.

Keywords: Motivation; Achievement; Students; Models

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Introduction

The professionals of the education and higher learning system have focused for many years on some factors influencing academic performance. One of the most important factors is academic engagement as it is essential to learning in students and university students. It is considered as a significant element in the determination of individual development and academic achievement in university students (Oriol-Granado, Mendoza-Lira, Covarrubias-Apablaza, & Molina-Lopez, 2017; Al-Rashidi, Phan, & Ngu, 2016). Academic engagement is defined as the energy level of a student in performing his/her academic tasks and also the achieved efficiency and effectiveness (Strobel, Tumasjan, & Sporrle, 2011). Those university students who show academic engagement can focus highly on target subjects and problems in learning. Moreover, they tend to work harder, enjoy doing their academic tasks, are more dedicated to following regulations in academic environments, avoid inappropriate and conflicted behaviors, and perform with better results in tests (Closson & Boutilier, 2017).

The theory of academic engagement developed by Astin in 1984 includes some constructs in the research literature including the behavioral, cognitive, and emotional aspects of engagement (Al-Rashidi, Phan, & Ngu, 2016; Dolzan, Sartori, Charkhabi, & De Paola, 2015; Pietarinen, Soini, & Pyhalto, 2014; Gala et al., 2014). Behavioral engagement involves university students' active involvement in social groups, peer relationships, study in the university and at home, participation in extraordinary programs in the university, and showing positive behaviors (Archambault, Janosz, Fallu, & Pagani, 2009). Cognitive engagement refers to individual investment in a learning activity that university students consider including self-regulation, required vocational learning, and applied learning strategies like semantic development or expansion instead of memorization (Sedaghat, Abedin, Hejazi, & Hassanabadi, 2011; Fredricks, Blumenfeld, & Paris, 2004). Emotional engagement is related to engagement, interest, enjoyment, vitality, and willingness regarding participation in classes and generally, it is an attachment to the teacher, peers, learning activities, and university environment (Cho & Cho, 2014).

Academic buoyancy is one of the variables that influenced university students' academic engagement. Academic buoyancy is defined as the successful potential that students show in encountering and overcoming academic barriers and challenges (Comerford, Batteson, & Tormey, 2015). The studies by Pourabdol, Sobhi-Gharamaleki, and Abbasi (2015) and Balkis (2013) indicated that those students who showed higher academic buoyancy were more engaged and interested in their education. Precedent factors are focused in related to academic buoyancy regarding three-dimensional levels including physiological factors, academic factors related to involvement in academic processes, and factors related to family and peers. Different studies have shown that the precedent factors of academic buoyancy may have some effects on academic engagement. The psychological precedents include academic self-efficacy and academic help-seeking involved in academic buoyancy and aspiration.

Another variable referred to as academic help-seeking can be effective on students' academic engagement. It is considered as a learning self-efficacy strategy and students who rely on others to overcome their stressful academic emotions can see their help-seeking behaviors cause high advancement of invitations, high self-efficacy, and high academic performance (Karabenick, 2011; Holt, 2014). The study by Halt (2014) showed that help-seeking behavior is associated with academic

buoyancy. Hoyne and McNaught (2013), and Hashemi, Bayrami, Vahedi, and Beyrami (2017) found that help-seeking leads to increased academic engagement.

Parenting styles and perceived social support can be considered as a part of family precedents. Parenting styles are defined as certain behaviors performed by parents individually and in relationships with each other that influence transforming consequences with a child due to involved level of responsiveness and demanding behavior observed about parents (Burke, 2006). Baumrind (1966) specified three parenting styles. Authoritative parents usually expect their children to behave in well-established manners and impose some clear behavioral norms on them, they encourage their children to be independent and interact with their children through an open and flexible relationship system. Authoritarian parents usually have many values to protect their power and suppress any efforts started by their children to challenge their authoritative situation. Their children are not permitted to argue with their parents or make a decision independently. Permissive parents allow their children to regulate their behaviors and make decisions by themselves, and they do not impose any rules to supervise their children's behaviors (Baumrind, 1966). A study by Tajadini, Khezri-Moghadam, Zinali, and Tajadini (2015) indicated that parenting styles are good predictors of academic buoyancy. Researches by Attaway and Bry (2004) and Niemiec, Lynch, Vansteenkiste, Bernstein, Deci, and Ryan (2006) showed that parents' styles have a positive relationship with inner motivation when characterized by supporting self-autonomy, involvement, and warmth.

Regarding academic buoyancy and academic engagement in learning institutes, some precedent factors are addressed including transformational teaching and perception of class structure. Transformational teaching is based on the belief that teachers can make some significant changes in students' lives (Slavich & Zimbardo, 2012). Transformational teaching emphasizes advancement and promotion in a learning environment and individual developments of students through the performance of activities oriented to experiencing learning concepts (Slavich & Zimbardo, 2012).

Academic engagement is among the factors influencing students' academic life. Thus, it is important to determine the factors that influence educational and training practitioners including families and learning institutes; therefore, it is possible to provide some opportunities for adolescents moving toward higher places in their academic life. Previous researches have rarely focused on academic engagement. Therefore, to remove the observed gaps in the literature, this work was conducted with the aim to design and validate a structural model for academic engagement based on personal, family, peer, and educational factors with the mediation role of academic buoyancy in students' of Esfarayen University of Technology, Iran, according to the conceptual model presented in figure 1. Based on the aim of this study, the following research hypotheses were considered: 1) individual, family, and educational factors have positive relationships with academic buoyancy; 2) academic engagement has correlations with individual, family, and school factors through academic buoyancy.

Methods

The present research was performed through a correlation method (path analysis). The statistical population included all undergraduate students of Esfarayen University of Technology during the academic year 2016-17. The total number of undergraduate students in this University was 1,600 individuals.

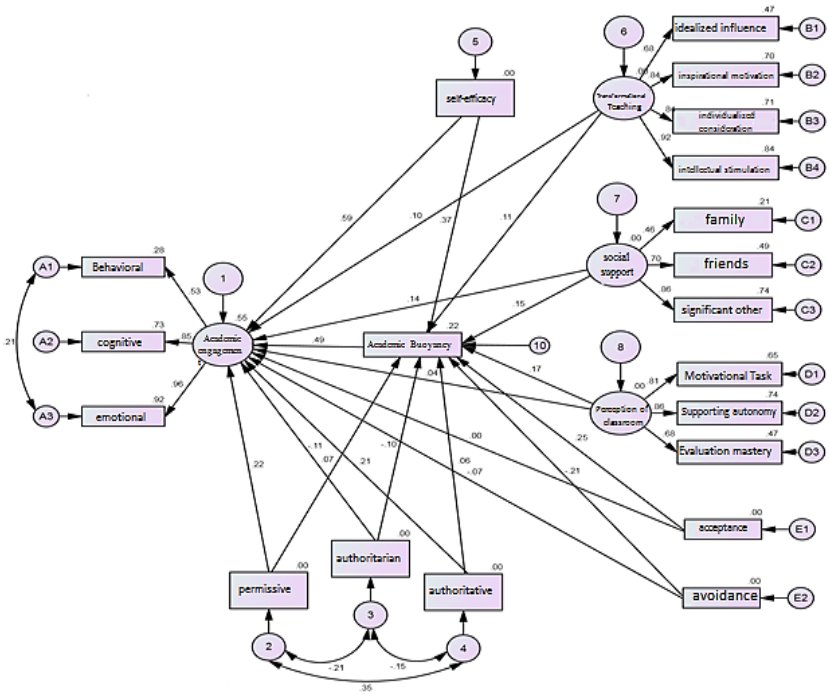

Figure 1. The final model tested with standardized anticipated statistics

According to the statistical population size, 320 subjects were selected as the study sample through the randomized cluster sampling method, and after the consideration of a subject loss, 304 individuals were included in the study sample. The following ethical principles were taken into consideration in the present study. All subjects received written information about the research and participated in the research voluntarily. The participants were assured that all information would remain confidential and would be used for research purposes only. To respect their privacy, the participants' names and surnames were not registered.

Academic Self-efficacy Scale: This questionnaire was designed by Owen and Feraman (1998). It includes 32 items scored based on a 5-point Likert scale ranging from 1 (very low) to 5 (very high). In an Iranian sample, the internal consistency of this scale was 91% for the whole test including 90% for girls and 91% for boys. Cronbach's alpha of this scale indicated that this tool has good internal consistency. The validity of this questionnaire was verified through exploratory factor analysis and confirmatory factor analysis. Moreover, Cronbach's alpha coefficient of academic self-efficacy was 0.76 in the present work.

Help-seeking Questionnaire: This questionnaire was designed by Ryan and Pintrich (1997). The Help-Seeking Questionnaire has two dimensions, acceptance of help-seeking and avoidance of help-seeking. Each dimension has 7 items scored based on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Ryan and Pintrich (1997) reported a Cronbach's Alpha of 89% for the validity of the avoidance of help-seeking dimension. The validity of this dimension was obtained using varimax rotation indicating that the avoidance of help-seeking

dimension can explain 27% of the total variance. In addition, in the present research, Cronbach's alpha coefficient of the acceptance and avoidance dimensions was 0.74 and 0.72, respectively.

Perception of Classroom Structure Questionnaire: This scale was developed by Blackburn (1998). It includes the 3 subscales of motivational tasks (9 items), autonomy support (5 items), and mastery evaluation (11 items). The questions were scored based on a 5-point Likert scale ranging from 5 (strongly agree) to 1 (strongly disagree). Blackburn reported the validity coefficient values of the motivational tasks, autonomy support, and mastery evaluation subscales to be 0.85, 0.65, and 0.80, respectively. Moreover, we obtained a Cronbach's alpha coefficient of 0.63, 0.70, and 0.91 for of the subscales of motivational tasks, autonomy support, and mastery evaluation, respectively.

Transformational Teaching Questionnaire: The Transformational Teaching Questionnaire (TTQ) was designed by Beauchamp et al. (2010). It consists of 16 questions that measure the 4 subscales of intellectual stimulation, inspirational motivation, individualized consideration, and idealized influence. The questions are scored based on a 5-point Likert scale ranging from 1 (never) to 5 (always). Beauchamp et al. (2010) found a general inner consistency of 96% for this tool and confirmed the validity of questionnaire constructs. Moreover, in the present work, Cronbach's alpha coefficients of the subscales of intellectual stimulation, inspirational motivation, individualized consideration, and idealized influence were found to be 0.75, 0.78, 0.74, and 0.73, respectively.

Perceived Parenting Style Questionnaire: The Perceived Parenting Style Questionnaire was developed by Baumrind in 1967. This questionnaire consists of 30 items divided into the 3 subscales of permissive, authoritative, and authoritarian parenting styles. The items are scored based on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Baumrind (1966) reported the validity of the permissive, authoritative, and authoritarian parenting styles subscales of this questionnaire to be 81%, 85%, and 92%, respectively, using the test-retest method. Furthermore, in the present research, Cronbach's alpha coefficients of the subscales of permissive, authoritative, and authoritarian parenting styles were 0.83, 0.71, and 0.71, respectively.

Multidimensional Scale of Perceived Social Support: This scale was developed by Zimet, Dahlam, Zimet, and Farley (1988). The Multidimensional Scale of Perceived Social Support (MSPSS) consists of 12 items with 4 items for each dimension of social support (family, friends, and significant other). The items are scored based on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The results obtained from a study by Zimet et al. (1988) showed appropriate reliability and validity for this scale. In the present study, the Cronbach's alpha coefficient of the 3 subscales of family, friends, and significant other was 0.74, 0.69, and 0.80, respectively.

Academic Buoyancy Scale: Dehghanizade and Hosseinchari (2012) developed this questionnaire using a model adapted from the Academic Buoyancy Scale by Martin and Marsh (2006) with 4 items. This tool has 9 items that measure the degree of agreement/disagreement based on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Dehghanizade and Hosseinchari (2012) reported an appropriate validity for their questionnaire. Moreover, they obtained a reliability value of 0.80 and 0.73 for this tool using Cronbach's alpha and test-retest method, respectively. In the present study, a Cronbach's alpha coefficient of 0.69 was obtained for the Academic Buoyancy Scale.

School Engagement Scale: The School Engagement Scale (SES) was developed by Fredricks et al. (2004). It includes 15 items in the 3 subscales of behavioral, emotional, and cognitive aspects. The items of the SES are scored on a 5-point Likert scale ranging from 1 (never) to 5 (always). Fredricks et al. (2004) report a reliability coefficient of 0.86 for this scale. In addition, in the present research, Cronbach's alpha coefficients of the behavioral, emotional, and cognitive aspects subscales were 0.87, 0.91, and 0.73, respectively.

The significance level in this study was considered to be 0.05. Data analyses were performed using SPSS software (version 22; IBM Corp., Armonk, NY, USA).

Results

The mean (standard deviation) age of the participants in this study was 22.36 (5.13) years. Descriptive characteristics of the research variables are presented in table 1. First, outlier detection was performed using kurtosis, skewness, box-plot, and Kolmogorov-Smirnov test with statistical defaults. Then, they were eliminated using the Mahalanobis distance test. Moreover, after assessing data normalization, the developed model was evaluated and confirmed to measure the two research variables. In addition, the obtained results of average variance extracted (AVE) showed that all subscales, including academic engagement, academic self-efficacy, help-seeking, perception of class structure, transformational teaching, perceived parenting style, perceived social support, and academic buoyancy, showed values higher than 0.5 as a criterion threshold in the measurement model. Thus, there is a convergent validity for the proposed measurement model. The integrated reliability of constructs indicated that the obtained values for the components were higher than 0.07 as criterion threshold, and finally, AVE and CR were confirmed for all questionnaires developed in this study.

The results showed significant correlations between academic engagement and academic self-efficacy, help-seeking, perception of class structure, transformational teaching, perceived parenting style, perceived social support, and academic buoyancy ($P < 0.01$).

The obtained root mean square error of approximation (RMSEA) was 0.049. It is less than 0.1, thus indicating that the mean square error of the model is appropriate and the model can be accepted. Moreover, the freedom degree in chi-square (2.89) is a value between 1 and 3, and GFI, CFI, and NFI indicators are approximately ≥ 0.9 indicating that the model proposed for measuring the research variables is an appropriate model.

According to table 2, the obtained paths for academic self-efficacy, help-seeking, perception of class structure, transformational teaching, perceived parenting style, perceived social support, and academic buoyancy showed some significant direct effects on academic engagement.

Table 1. Fitness testing indexes of present paths model among the research variables

Fit Statistics	Acceptable Domains	Values
χ^2/df	< 3	2.089
RMSEA	< 1. 0	0.049
GFI	< 0.9	0.978
NFI	< 0.9	0.941
CFI	< 0.9	0.950
DF	-	0.137

Table 2. Direct effect and path coefficient values in the model

Direct effects of variables	b	B	R^2
Effect of transformational teaching on academic engagement	0.39	0.10	0.039
Effect of perceived social support on academic engagement	0.48	0.14	0.067
Effect of buoyancy on academic engagement	0.14	0.28	0.039
Effect of perception of class structure on academic engagement	0.06	0.04	0.002
Effect of permissive style on academic engagement	0.36	0.22	0.079
Effect of authoritarian style on academic engagement	-0.32	-0.11	0.002
Effect of authoritative style on academic engagement	0.29	0.21	0.035
Effect of acceptance of help-seeking on academic engagement	0.24	0.21	0.050
Effect of avoidance of help-seeking on academic engagement	-0.12	-0.07	0.008
Effect of self-efficacy on academic engagement	0.31	0.59	0.180

As can be observed in table 3, the considered indirect paths were obtained according to the standardized values (β), non-standardized values (b), and R2, and then, confirmed using an estimating method for maximum likelihood (ML).

Discussion

This study was conducted with the aim to design and validate a structural model for academic engagement based on personal, family, peer, and educational factors with the mediation role of academic buoyancy in students of Esfarayen University. In general, study variables explained 0.55 of the variance of the criterion variable (academic engagement). The obtained results about hypothesis 1 suggested that academic self-efficacy, acceptance of help-seeking, perceived social support, authoritative and permissive parenting styles, classroom structure, and transformational teaching positively predicted academic engagement. Regarding the direct and positive relationship of academic self-efficacy with academic engagement, the obtained findings are consistent with those of Oriol-Granado et al. (2017), Bakker, Sanz Vergel, and Kuntze (2015), Rahmati (2015), and Tan and Tan (2014).

The obtained findings suggested that the authoritative parenting style positively predicts academic engagement. This result is consistent with those obtained by Fletcher, Serena Shim and Wang (2012), Attaway and Bry (2004), and Niemiec et al. (2006).

Table 3. Direct effect, indirect effect, and path coefficient values in the model

Indirect effects of variables	Direct Effects (B)	Indirect Effects (B)	R^2
The effect of self-efficacy on academic engagement with the mediation role of academic buoyancy	0.20	0.39	0.078
The effect of transformational teaching on academic engagement with the mediation role of academic buoyancy	0.40	0.26	0.104
The effect of perceived social support on academic engagement with the mediation role of academic buoyancy	0.21	0.19	0.039
The effect of perception of class structure on academic engagement with the mediation role of academic buoyancy	0.64	0.23	0.147
The effect of acceptance of help-seeking on academic engagement with the mediation role of academic buoyancy	0.38	0.11	0.041
The effect of avoidance of help-seeking on academic engagement with the mediation role of academic buoyancy	-0.19	-0.13	0.024
The effect of permissive style on academic engagement with the mediation role of academic buoyancy	0.31	0.13	0.04
The effect of authoritarian style on academic engagement with the mediation role of academic buoyancy	-0.37	-0.06	0.022
The effect of authoritative style on academic engagement with the mediation role of academic buoyancy	0.30	0.07	0.021

Social resources like parental support can activate students' self-efficacy, self-esteem, and optimism, and make them feel like they have the ability to control academic settings. Therefore, they are more self-confident as they feel proud about what they do, perceive their tasks to be meaningful, and continue their education with enthusiasm (Xanthopoulou, Bakker, Demerouti, and Schaufeli, 2007). The obtained findings suggest that the authoritarian parenting style negatively predicts academic engagement. This finding is consistent with those obtained by Zakeri et al. (2013) as quoted by Baghaeian (2011**(**, and Mortazanajad, Mostafafi, and Vahedi (2009). The supervision-limitation style increases procrastination tendencies related to the authoritarian parents. Authoritarian parents are not required to justify their commands, and demand absolute obedience and respect from their children. Decreased self-esteem is characteristic of children of authoritarian families as one of the factors for procrastination behaviors. In addition, these parents have learned that they should not start their tasks unless they are going to perform them with high proficiency. This means that idealism and perfectionism lead to procrastination attitudes. Thus, the individual avoids doing tasks because of the fear of failure, and when he/she is required to perform tasks, he/she will do them at the last moment.

The obtained findings suggest that transformational teaching can positively and directly predict academic engagement. These results are in line with the results obtained by Noland and Richards (2014) and Jabari (2017). Transformational teaching is associated with increased attitudes, beliefs, and motivation with greater enjoyment of the classroom and teacher, and high self-regulation. Moreover, it is associated with significant improvements in self-efficacy and intrinsic motivation among students (Beauchamp & Morton, 2011). The application of transformational teaching resulted in higher learning, better understanding levels, more classes involved, and higher persistence and interaction in performing academic tasks (Ebrahimkhani, 2015).

The obtained findings suggest that academic buoyancy can positively predict academic engagement. These results are in accordance with the results obtained by Pourabdol et al. (2015), Balkis (2013), Watson, Deary, Thompson, and Li (2008). Stressors have some roles in academic burnout. In the presence of stress factors, especially when intensified, students may experience a lack of control over environmental conditions and experience helplessness which will lead to reduced self-esteem. Possibly, when a student feels helpless in overcoming stressful situations, he/she postpones his/her homework and academic tasks, and consequently, as expected this trend results in emotional exhaustion, and finally, academic burnout (Schwarzer & Diehl, 2015). As academic buoyancy shows the level of academic resilience, students with high academic buoyancy are more successful in dealing with obstacles, challenges, different levels of stress, etcetera. Therefore, students with academic buoyancy can overcome stressful situations and develop self-efficacy, and thus, do their homework enthusiastically and prevent academic burnout. Furthermore, they show more aspiration and interest in education, and work harder to achieve their academic goals (Pourabdol et al., 2015).

Concerning the predictive power of self-efficacy regarding academic engagement mediated by academic buoyancy, the obtained findings were in line with those of Carroll et al. (2009), Mercer, Nellis, Martinez**,** and Kirk (2011), and Dehghanizade and Hosseinchari (2012). The felt self-confidence and self-efficiency encourage students to get involved in developmental tasks, undesirable current conditions, and future challenges. Students with high self-confidence can be highly energetic in academic performance and believe that they can overcome problems and challenges.

Such self-confidence is observed with adaptive buoyancy functions regarding personal capabilities when encountering environmental stressors (Dehghanizade & Hosseinchari, 2012).

The obtained findings suggest that social support is indirectly correlated with academic buoyancy. This result was in accordance with the results obtained by Dawson and Pooley (2013), Shahmoradi, Savari, and Pasha (2013), and Moradi, Dehghanizade, and Soleimanikhashab (2015). Rueger, Malecki, Pyun, Aycock, and Coyle (2016) proposed the stress-buffering (SB) model of social support, which indicated that social support is regarded as a protective resource that enables people to cope with stress, distress, and depression. In other words, social support is considered to be a facilitator of coping with stress. In addition, social support provides individuals with positive social contacts with others, which contributes to emotional balance and reduces burnout (Boren, 2013). One reason provided for low academic burnout in students with high social support is that self-efficacy, high self-esteem, optimism, resilience, and a sense of control over the academic environment can increase coping abilities in the face of stressful events, and thus, they can effectively encounter stressors. As a result, they are more confident and prouder about their accomplished tasks; they consider meaningful values for their success and continue to study with eagerness (Xanthopoulou et al., 2007).

Regarding the positive predictive power of permissive parenting style regarding academic engagement mediated by academic buoyancy, it can be said that permissive parents consider high values for their children, they allowed them to express themselves, and they expect very little of their children; therefore, they allow their children to monitor their own activities and decide about issues on their own. This means that the children of permissive parents have been allowed to perform trial and error on various issues; thus, they have learned how to deal with their problems and resolve them. In other words, they are used to this strategy, and they have had to resolve their problems on their own and thus, they feel responsible for their own problems.

Concerning the negative predictive power of the authoritarian parenting style regarding academic engagement mediated by academic buoyancy, the obtained findings were in line with those reported by Diaz-Morales, Escribano, Jankowski, Vollmer, and Randler (2014), Ferreira, Nelas, Duarte, Albuquerque, Grilo, and Nave (2013), Farahmand and Fouladchang (2017), and Tajadini et al. (2015). Children of authoritarian parents, who behave according to their parents' will, show suppressed self-esteem, low independence and mental and spiritual stability, high vulnerability to psychological stresses, and a decline in academic success. They expect others to decide their places and lack independence and the ability to face problems and issues on their own.

A limitation of the present study was the lack of a research background about academic engagement as a variable. As this investigation is performed as a correlational study, the causal inference of the findings should be applied with caution. In addition, the data gathering methodology in the present work was designed based on a number of questionnaires, but it is suggested that each variable data should be incorporated using multiple methods to obtain results with higher generalizability.

Conclusion

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Conflict of Interests

Authors have no conflict of interests.

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Comparison of the Effectiveness of Grief Counseling and God-Oriented Spiritual Counseling on Depression Symptoms and Suicidal Ideation in People with COVID-19 Grief

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Qualitative Study

Abstract

Background: Due to the COVID-19 pandemic, grief is currently a widely experienced psychological problem. Depression symptoms and suicidal ideation are associated with COVID-19 grief. Therefore, the present study was conducted to compare the effectiveness of grief counseling and God-oriented spiritual counseling on depression symptoms and suicidal ideation in people with COVID-19 grief.

Methods: The present experimental study was conducted with a pretest-posttest design, a control group, and follow-up. The study population consisted of all residents of Shahr-e-Rey, Iran, who had lost a member of their family due to COVID-19. Through purposive sampling, 51 individuals who were willing to participate in the study and met the study inclusion criteria were selected and were randomly assigned to 2 experimental groups and 1 control group (17 in each group). In the 3 stages of pretest, posttest, and follow-up, data were collected using the Beck Depression Inventory (Beck et al., 1996) and Beck Scale for Suicidal Ideation (Beck et al., 1988). The collected data were analyzed using repeated measures analysis of variance (ANOVA) in SPSS software.

Results: The results showed that both methods of intervention were effective in reducing depressive symptoms and suicidal thoughts. However, the effect of God-oriented spiritual counseling was greater than the other intervention. The study findings showed that the interaction effect of group × time for symptoms of depression ($\eta 2 = 0.343$; $P < 0.001$; $F = 12.53$) and suicidal thoughts ($\eta 2 = 0.148$; $P < 0.001$; $F = 4.16$) were significant at the 0.01 level.

Conclusion: In general, the present study showed that God-oriented spiritual counseling, compared to grief counseling, is more effective on the symptoms of depression and suicidal thoughts.

Keywords: Grief, God-oriented spiritual counseling, Depressive symptoms, Suicidal ideation

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Introduction

Coronavirus disease (Covid-19) is an infectious disease that was first identified in December 2019 in the city of Wuhan, China. According to estimates, the mortality rates of this disease range from 4 to 11% (Salehi et al., 2021). As a result of the initial global spread of this virus two and a half years ago, 552 million people were infected and approximately 6.34 million died. According to official statistics, by July 2021, about 7.24 million people in Iran were infected and nearly 141 thousand people died because of this disease (Rassouli, Ashrafizadeh, Shirinabadi, & Akbari, 2020). Considering that each death related to Covid-19 bereaves about 9 people, it can be said that in Iran, with the death of nearly 141 thousand people, more than 1 million people have experienced grief (Verdery, Smith-Greenaway, Margolis, & Daw, 2020). Moreover, this epidemic has changed the experience of the natural process of mourning. Bereaved people hold very private funerals and burials, which often take place without the presence of family members and the physical presence and consolation of friends and acquaintances, and with minimal rituals and consolations (Wallace, Wladkowski, Gibson, & White, 2020). The lack of physical presence of friends and acquaintances at the mourning ceremony leads to an incomplete mourning process (Zhai & Du, 2020). The psychological, social, and physical consequences of social distancing (quarantine) can also disrupt the natural mourning process and complicate its process. It has been shown that unexpected deaths, low social support, restrictions on visiting while sick, a lack of care during illness, feelings of guilt, job insecurity, and financial insecurity are likely to cause complicated grief and depression after the death of a loved one (risk factors are prominent among deaths caused by Covid-19) (Wallace et al., 2020, Goveas & Shear, 2020).

Epidemiological and clinical studies have reported a relationship between depression and loss and bereavement (Kendler, Hettema, Butera, Gardner, & Prescott, 2003). Depression is a natural experience in the grieving process (Palmer, Saviet, & Tourish, 2016). A person who experiences depression during this period feels like the world is worthless, lacks energy, does not enjoy life, and is in a low mood. The deaths caused by Covid-19 may also affect the way a person thinks about him/herself, the world, and the future, and may result in depression. Victims of the pandemic, for example, may no longer perceive the world as a safe place, might not feel in control of the situation, and might lack self-efficacy. Those who lost a loved one during the epidemic felt lonely from the beginning because of the epidemic's restrictions on religious and cultural ceremonies. This feeling of loneliness and the inability to perform religious and cultural rituals cause depression, (Mortazavi, Assari, Alimohamadi, Rafiee, & Shati, 2020). Another negative psychological consequence of complex and severe bereavement is suicidal thoughts and actions (Simon, Saxe, & Marmar, 2020). The thought of suicide is usually because the person considers the world worthless and does not enjoy it, or the individual is also looking for death in order to reunite with the lost loved one. Research has shown that people who are bereaved due to Covid-19 have increased suicidal thoughts in the future (Gunnell et al., 2020). However, the mental health needs of those who have lost loved ones to Coronavirus have been neglected (Lee & Neimeyer, 2022). While the death of family members and close friends is one of the most stressful life events and is one of the most stressful, little attention is paid to the grief of the survivors of deceased covid-19 patients, which has serious behavioral (such as restlessness and fatigue) and psychological (depression and suicidal thoughts) consequences (such as increasing the risk of heart attack) (Stroebe, Schut, & Stroebe, 2007). Research has shown that

grief counseling and treatment are necessary and effective in these circumstances (Goveas & Shear, 2020). To guide people through their natural bereavement process, primary care systems should identify people experiencing severe symptoms of bereavement and provide them mental health services (Simon et al., 2020). The provision of such services might improve patients' psychological well-being (Momeni & Sahab Negah, 2020).

As a response to the global spread of the Coronavirus, the Ministry of Health, Treatment, and Medical Education has developed a 5-session protocol designed to provide grief counseling to survivors of the deceased, caused by covid-19 the primary health system by utilizing a cognitive-behavioral approach (Hajebi, Rasoulian, Khadim al-Reza, Fathi, & Asadi, 2020). This protocol uses behavioral, cognitive, and emotional techniques, as well as complex grief treatment. However, its effectiveness has not yet been thoroughly investigated in any research. Considering that spirituality is an integral part of mental and physical health, researchers have tried to design consultations based on spirituality. Human beings have two basic spiritual and natural (material) dimensions, and multidimensional spiritual therapy takes into account both of these dimensions. The focus of therapy is on the origin and the resurrection of man and his tendency to seek God, due to the originality of the spiritual dimension. In this psychological intervention, the activation of the spiritual dimension is emphasized as an effective method for achieving psychological balance and transcendence. To engage with spirituality, a person must activate their area of perceived origin correctly, because he/she is formed with a certain idea about the existence of God. As a result of the incorrect ideas that resulted from educational patterns and experiences during the individual's transformation, he has the correct idea of consciousness and God. One's perception of the attributes of creativity and lordship is formed in them. This issue unifies human actions and behaviors (Janbozorgi, 2016).

In a semi-experimental study, Rohani, Janbozorgi, Ahadi, and Beliad (2018) concluded that the short-term pattern of multidimensional spiritual therapy in the experimental group led to a significant reduction in depression symptoms. Faraji, Nouhi, Peiade-koohsar, and Janbozorgi (2021) showed that God-oriented spiritual counseling reduces the symptoms of mental disorders and their subscales. Despite the prevalence of bereavement among Covid-19 survivors, no comprehensive study has been conducted to investigate the effectiveness of bereavement counseling and God-oriented spiritual counseling. Due to the characteristics of bereavement in the Corona era, its high stress, other simultaneous losses such as job loss, lack of social and emotional support, and the lack of performing many relaxing traditional rituals, grief is experienced differently because of Covid-19 (Stroebe & Schut, 2021). Thus, the present research was conducted with the aim to compare the effectiveness of grief counseling and God-oriented spiritual counseling among the survivors of the deceased due to Covid-19.

Methods

The present study was an experimental research with a pretest-posttest design, a control group, and follow-up. The statistical population of the present study consisted of all individuals who had lost a family member due to Covid-19 in the areas covered by Tehran-Shahr-e-Rey University of Medical Sciences. Participants were selected through purposive sampling method based on the study inclusion criteria and their willingness to participate in the study and were randomly assigned

to 2 experimental and 1 control group. From among the study population, 51 people were selected for the experimental studies, considering the number of applicants for experimental studies. After the targeted non-transcendental sampling, participants were randomly divided into 3 groups of 17 individuals (2 experimental groups and 1 control group).

The study inclusion criteria included the death of a first-degree relative due to Covid-19 disease in the last 3-6 months, age of 30-40 years, female gender, reading and writing literacy, the ability to speak Farsi, belief in the existence of God, and the completion of the informed consent form before entering the research. The study exclusion criteria included receiving any mourning interventions or psychological or pharmaceutical treatments before or simultaneously to the implementation of the present study, the presence of severe physical or mental disorders (such as drug abuse, personality disorders, psychosis, or symptoms such as delusions, hallucinations, lack of awareness of time and place) that made the intervention impossible, and absence from more than 2 sessions. Then, the people who were bereaved were contacted individually and the people eligible to participate in the research were provided with explanations regarding the general objectives of the research, its advantages, and disadvantages, and the process and duration of the research so that they could decide to take part in the research with full of knowledge. After random sampling and customization in the groups, the pretest was carried out, and participants responded to a set of questionnaires online (via Google Meet). Along with the pretest, the written informed form of participation in the research was also completed by the participants. Next, the 5 grief counseling protocol (Table 1; Hajebi et al., 2019) was implemented in the first experimental group and the 7-session God-Oriented Spiritual Counseling protocol (Table 2; Janbozorgi, 2016) in the second experimental group online and using the Google Meet program. The current research has been registered in the Ethics Committee of the Azad University of Karaj under the code of ethics number IR.IAU. K. REC.1401.007.

In the present study, the Beck Depression Inventory (BDI-II) and Beck Scale for Suicidal Ideation (BSSI) were used to collect data and implement interventions.

Beck Depression Inventory: The BDI-II contains 21 separate items, which are scored on a Likert scale ranging from 0 to 3. The BDI-II is designed to measure depression symptoms. A score of 0 and 3 indicate the lowest and the highest intensity of the experience of a resident, respectively. The total score of this questionnaire ranges from 0 to 63.

Table 1. Description of the grief counseling protocol

Meeting	Description of the meeting
First session	Objective: Content: Demographic Properties, Psychological Evaluation, Dear Death Narrative, Evaluation of Mourning Intensity, Talk about the Structure of Meetings
Second session	Objective: Flexible event evaluation and increased understanding of the reality of lack Dedicated goals: Increasing the understanding of the reality of lack and helping to cope with the pain caused by lack
Third session	Purpose: Meeting Content: Review of homework, mourning methods, mourning manner, meaningful, assignment
Fourth Session	Purpose:Meeting Content: Task Review, Investigating the Role of the Future in one's Life, Post-Death Problems, Problems Solving Problems, Problem Solving Training, Task
Fifth meeting	Purpose: Meeting content: Task review, examining emotions and emotions, examining behavioral change,; checking the changes, in attitude, and conclusion and farewell

Table 2. Description of the God-Oriented Spiritual Counseling

Meeting	Description of the meeting
First session	Purpose: providing intellectual proof for God through an exploratory method Meeting Content: Contact yourself (before and start and after all is the will or starter or end, and what is the consequences or what is the consequences of acceptance or denial?) -It End- Registering experiences (Is there a God? Proof of denial? If you cannot prove God, then try to deny it without using learned), God's discovery through natural reason. Summary and practice workshop
Second session	Purpose: Knowing the Gods Meeting content: Expressing any concept of God, expressing their history, analyzing observation and analyzing life conflicts and their relationship with spiritual conflicts, Summary, Workout Exercise, Task
Third session	Purpose: Meeting content: Task, rewriting one's images of God, drawing them all because of the invalid and documented of the Qur'an, How can we have a valid understanding of God?, summary, completing the dedication worksheet, and discovery of godliness
Fourth Session	Objective: Meeting content: Motivational question (You know what the best you know about what you know what you have?), the discussion (usually the discussion is that the best source of God is the Qur'an, Do not accept the scriptures, summary, and worksheet regarding searching in authentic religious sources, especially the Qur'an, not topics Goal: creativity
Fifth meeting	Meeting content: Expression of experiences, my relationship with the real God, How did he create me? , Intellectual discussion: Does indirect creation make sense?
Sixth session	Purpose: Meeting content: Expressing experiences, Is it possible for God not to have a plan or care for His creation?, spiritual evidence of lordship (God's guidance, sustenance, management, and ownership), Why God's Lordship helps our mental health?
Seventh Session	Goal: Towards a pure life and spiritual identity Meeting content: Expression of experiences, Who can set the best plan for human happiness? What is the validity of life plans?

The psychometric properties of this questionnaire were investigated by Beck et al. (1996) and a high internal consistency (α = 0.57) and high test reliability (r = 0.93) were reported. Moreover, the Persian version of the questionnaire was presented by Ghassemzadeh, Mojtabai, Karamghadiri, and Ebrahimkhani (2005), and its validity and reliability were confirmed. The reliability of this questionnaire was evaluated using the Cronbach's alpha internal consistency method (α = 0.87), and the test-retest method (r = 0.74).

Beck Scale for Suicidal Ideation: The BSSI was designed by Beck et al. in 1988 to measure suicidal thoughts, desire, planning, and preparation. This scale consists of 19 questions that are scored on a Likert scale ranging from 0 to 2; thus, the total score of the scale ranges between 0 and 38. The first 5 questions have a screening scale, so that if the participant scores 0 on questions 4 or 5, there is no need to continue answering and his/her idea score is 0; otherwise the participant will have to answer all questions. The Cronbach's alpha coefficient of this scale was about 0.90. Moreover, the correlation coefficient of this scale was 0.75 with a backdrop of 0.75 with a disappointment scale of 0.62, indicating the validity of this scale (Beck et al., 1988). In Iran, researchers calculated a Cronbach's alpha coefficient of 0.83 and reported the scores of the idea scale and the R = 0.57 correlational depression scale (Esfahani, Hashemi, & Alavi, 2015). The reliability of this questionnaire was assessed through Cronbach's alpha internal consistency method (α = 0.87), and the test-retest method (r = 0.74).

Due to the outbreak of the Coronavirus and in order to prevent its transmission to the participants, the intervention was performed online. The aftermath of all participants in the experimental and control group was completed after the last consulting session. Moreover, the follow-up was performed after 2 months. Participants' responses were then entered into SPSS software (version 26; IBM Corp., Armonk, NY, USA) to perform statistical analysis to examine the hypotheses. In this study, the symptoms of depression, suicidal thoughts, and perceived spirituality were the dependent variables, and information about them was collected in the 3 stages of pretest, posttest, and follow-up from the participants of the experimental and control groups. To test the effectiveness of implementing the independent variables on the dependent variables, repeated measures analysis of variance (ANOVA) was used. It is necessary to explain that before testing the research hypotheses, the assumptions related to repeated measures ANOVA, including the normality of the data distribution, the homogeneity of the error variances, the homogeneity of the covariance matrices of the dependent variables, and the condition of Mauchly's sphericity or equality of the error covariance matrix, were examined. Repeated measures ANOVA was used to compare the 3 groups in this study.

Results

The mean and standard deviation (SD) of the age and grief experience score of the participants was 43.65 ± 5.02 years and 4.12 ± 1.11 in the grief counseling group, 41.53 ± 5.70 years and 4.47 ± 1.01 in the God-oriented spiritual counseling group, and 8.33 ± 42.00 years and 4.65 ± 1.41 in the control group, respectively (Table 3). One-way ANOVA test results showed that there was no significant difference between the groups in terms of the mean and SD of age and duration of the grief experience.

The x^2 test results showed that there was no significant difference between the groups in terms of marital status, level of education, duration of grief experience, age, and relation to the deceased (Table 4).

Table 5 shows that the mean scores of depression symptoms and suicidal thoughts in the grief counseling and God-oriented spiritual counseling groups decreased compared to the control group in the posttest and follow-up phases. In this research, to test the assumption of normality of data distribution, the Shapiro-Wilk values of depression symptoms and suicidal thoughts were examined for each group in the 3 study stages. As can be seen in table 3, the Shapiro-Wilk values related to both dependent variables in all 3 groups in the pretest, posttest, and follow-up are insignificant at the 0.05 level. This article shows that the distribution of data related to variations of both depression symptoms and suicidal thoughts is normal.

According to the results of Levene's test, there were no significant differences in error variances related to either of the two dependent variables between groups and between pretest, posttest, and follow-up stages (Table 6).

Table 3. Mean and standard deviation of the age and grief experience of the participants in the research

Group	Variables	Mean ± SD
Grief Counseling	Age	43.65 ± 5.02
	Duration of grief experience	4.12 ± 1.11
God-Oriented Spiritual Counseling	Age	41.53 ± 5.70
	Duration of grief experience	4.47 ± 1.01
Control	Age	42.00 ± 8.33
	Duration of grief experience	4.65 ± 1.41

SD: Standard deviation

Table 4. Demographic variables

Variables	Groups	χ^2	P
Marital status	Single	2.15	0.707
	Married		
	Widowed/ Divorced		
Level of education	Diploma	1.41	0.965
	Assistant		
	Bachelor		
	MA & PhD		
Duration of grief experience	In the last 3 to 6 months	0.87	0.424
Age (year)	30 to 40	0.612	0.49
Relation to the deceased	Mother	2.55	0.864
	Father		
	Brother/sister		
	Spouse		

This finding shows that the assumption of homogeneity of error variances among the data is valid. In addition, table 6 shows that the assumption of homogeneity of the covariance matrices of the dependent variables is established for the symptoms of depression and suicidal thoughts. Furthermore, as can be seen in table 6, Mauchly's sphericity test showed that the chi-square value related to the symptoms of depression and suicidal thoughts was insignificant at the level of 0.05. This finding shows that the assumption of sphericity is valid for these 2 variables.

After evaluating the assumptions of the analysis and ensuring that they are established among the data, repeated measures ANOVA of implementation and the results of multivariate analysis showed that the effect of the implementation of the independent variables on depression symptoms (Wilks' lambda = 0.502; η^2 = 0.293; P = 0.001; F = 9.68) and suicidal thoughts (Wilks' lambda = 0.754; η^2 = 0.132; P = 0.009; F = 3.57) was significant at the level of 0.10.

Table 7 shows that the interaction effect of group × time for symptoms of depression (η^2 = 0.343; P = 0.001; F = 12.53) and suicidal thoughts (η^2 = 0.148; P = 0.001; F = 4.16) was significant at the 0.01 level.

The results of Bonferroni's post hoc test related to time comparisons show that the mean scores of depression symptoms and suicidal thoughts have decreased following the implementing of the independent variables in the posttest and follow-up stages (Table 8).

Table 5. Mean ± standard deviation and Shapiro-Wilk values of variables in the three study stages

	Group	Mean ± SD		
		Follow-up	Posttest	Pretest
Depression symptoms	Grief Counseling	16.43 ±3.31	13.25 ±3.23	13.87 ±3.44
	God-Oriented Spiritual Counseling	18.12 ±3.71	9.29 ±3.22	9.70 ±2.59
	Control	17.44 ±3.45	16.77 ±3.96	18.33 ±2.21
Suicidal Ideation	Grief Counseling	17.94 ±3.09	13.88 ±3.40	14.63 ±3.77
	God-Oriented Spiritual Counseling	18.00 ±4.11	9.94 ±3.13	11.35 ±2.87
	Control	20.17 ±4.00	17.94 ±4.22	17.52 ±3.48
Depression symptoms	Grief Counseling	0.947 ±0.441	0.981 ±0.970	0.933 ±0.268
	God-Oriented Spiritual Counseling	0.967 ±0.762	0.948 ±0.421	0.986 ±0.991
	Control	0.965 ±0.696	0.909 ±0.083	0.930 ±0.197
Suicidal Ideation	Grief Counseling	0.929 ±0.238	0.961 ±0.687	0.939 ±0.335
	God-Oriented Spiritual Counseling	0.907 ±0.088	0.909 ±0.095	0.948 ±0.429
	Control	0.953 ±0.468	0.939 ±0.280	0.973 ±0.854

SD: Standard deviation

Table 6. The results of the hypothesis test of the homogeneity of error variances, the equality of the variance-covariance matrices, and the equality of the error covariance matrix

Variables	Levene's F			F	Box's M	χ^2	Mauchly's sphericity
	Pretest	Posttest	follow-up				
Depression symptoms	0.17	1.43	0.39	0.91	12.03	0.18	0.996
Suicide Ideation	1.54	0.86	0.80	1.49	19.63	0.87	0.983

Table 8 shows that the difference in the scores of depression symptoms and suicidal thoughts between the pretest and posttest, and pretest and follow-up stages is significant, and the difference in the mean of those scores in the follow-up compared to the posttest is not significant. The results of Bonferroni's post hoc test show that there is a significant difference between the effect of the two methods of grief counseling and God-oriented spiritual counseling on the symptoms of depression and suicidal thoughts (Table 8). It can be seen that God-oriented spiritual counseling is a better way to reduce the symptoms of depression and suicidal thoughts in the survivors of the deceased due to COVID-19 compared to grief counseling.

Discussion

The present study was conducted to compare the effectiveness of grief counseling and God-oriented spiritual counseling on the symptoms of depression and suicidal thoughts in the survivors of the deceased due to Covid-19. The results showed that grief counseling is effective in reducing the symptoms of depression and suicidal thoughts. These results are consistent with the researches by Yousefpour, Akbari, Ahangari, and Samari (2017), Salabifard, Tajeri, and Rafiepoor (2020), Boelen, Lenferink, and Spuij (2020), and Treml et al. (2021).

Ghamari Givi, Zahed, and Fathi (2016) investigated the effectiveness of cognitive-behavioral group therapy on depression among mournful elderly individuals. They found that cognitive-behavioral group therapy reduces depression among these individuals by helping them through emotional discharge, doing fun homework, and fighting disturbing thoughts. In explaining these findings, it can be said that the cognitive-behavioral techniques that form the basis of bereavement counseling are among the main psychological treatments used to reduce depression. According to the cognitive perspective, mournful people should be helped to change their dysfunctional beliefs and adopt a new meaning for their life (Malkinson, 2001). There is a need to reorganize one's cognition and modify one's thoughts and create a new meaning. New information (i.e., loss) is reprocessed and integrated with pre-existing cognitive structures (Neimeyer, 2000); hence, an important part of grief counseling is examining one's beliefs, redefining them, and the narrative of death and loss, and acceptance of death. Another explanation for this finding is the use of exposure therapy in grief counseling.

Table 7. The results of repeated measures analysis of variance in explaining the effect of independent variables on depression symptoms and suicidal ideation

Variables	Effects	SS	Error of SS	F	P	η^2
Depression symptoms	Group	702.74	660.05	25.54	0.001	0.516
	Time	287.53	466.92	29.56	0.001	0.381
	Group*Time	462.80	885.02	12. 53	0.001	0.343
Suicidal ideation	Group	776.08	923.30	20.17	0.001	0.457
	Time	454.63	523.4	41.69	0.001	0.465
	Group*Time	165.160	953.85	4.16	0.004	0.148

SS: Sum of Squares

Table 8. Bonferroni's post hoc test results for pairwise comparisons of the effect of groups and times on depression symptoms and suicidal ideation

Variables	Groups	Times	Mean difference	Standard error	P
Depression symptoms	Posttest	Pretest	4.23	0.60	0.001
	Follow-up	Pretest	3.36	0.62	0.001
	Follow-up	Posttest	-0.86	0.59	0.442
Suicidal ideation	Posttest	Pretest	4.78	0.63	0.001
	Follow-up	Pretest	4.23	0.66	0.001
	Follow-up	Posttest	-0.55	0.58	1
Depression symptoms	God-Oriented Spiritual Counseling	Grief Counseling	2.15	0.75	0.018
	Control	Grief Counseling	-3	0.75	0.001
	Control	God-Oriented Spiritual Counseling	-5.15	0.72	0.001
Suicidal ideation	God-Oriented Spiritual Counseling	Grief Counseling	2.38	0.88	0.029
	Control	Grief Counseling	-3.04	0.87	0.003
	Control	God-Oriented Spiritual Counseling	-5.42	0.86	0.001

According to the dual processing model theory presented by Stroebe and Schut, (2021), bereaved people at any given moment oscillate between managing two categories of stressors, those related to loss and those related to recovery and restoration. According to this view, natural grief is a regulatory process that deals with facing losses and the related emotions such as depression.

Another finding of the present study was that God-oriented spiritual counseling was effective in reducing symptoms of depression and suicidal thoughts. These results are consistent with the researches by Rohani et al. (2018), and Faraji et al. (2021).

Hashemi (2019) showed that metacognitive therapy caused a slight improvement in these variables due to its greater focus on worry and rumination, but both therapies reduced suicidal ideation. It can be concluded that both religious-based cognitive behavioral therapy and meta-cognitive therapy are effective in reducing suicidal ideation. Rohani et al. (2018) reported a significant increase in the psychological well-being component after an intervention. They found that spiritual multidimensional psychotherapy is able to mobilize the spiritual dimension of clients by forming a belief framework against their cognitive challenges, encouraging them to live a healthy lifestyle, and increasing their hope, satisfaction, and life goals. People who have a strong belief in "God" without concepts and descriptions contaminated by their parents', materialistic, and limited perceptions can have a strong psychological and belief system, which is influenced by depression (Rohani et al., 2018). These people consider themselves alone, helpless, weak, and abandoned. When the four spheres (Self, Existence, Origin, and End) of human perception are activated with the focus of innate reason. In addition, from the distortions and misconceptions that are usually the result of educational experiences and patterns, they are settled and integrated and are pushed towards their reality, and thus, the level of human response, including behaviors, emotions, feelings, perceptions, cognitions, interpersonal relationships, and lifestyle, is moved towards balance and integration (Janbozorgi, 2016).

Nequee, Oraki, Janbozorgi, and Alipoor (2020) found that cognitive-behavioral therapy based on immunization against stress was less effective than spiritual multidimensional therapy in reducing negative thoughts than cognitive-behavioral

therapy that replaced irrational thoughts, with efficient cognitions and provided the patient with a complete treasure of skills without providing meaning in life.

However, the findings of some studies are inconsistent with the findings of the present study and show no significant difference between the effectiveness of these two treatment methods on the variables related to depression. For example, Taraghijah, Navabinezhad, Bou, and Kiamanesh (2007) compared the effectiveness of the cognitive-behavioral and spiritual group psychotherapy approaches in reducing depression in female students and found no statistically significant difference between the effectiveness of these two methods. In explaining the findings of the current research, it can be stated that, according to the belief of many researchers, psychotherapy and especially cognitive-behavioral therapies are influenced by the cultural background, intracultural beliefs, and values of the clients, and their effectiveness depends on the degree of harmony with the cultural and religious background of the people being treated (Hofmann, 2006). D'Souza and Rodrigo (2004) believe that integrative psychotherapy with a holistic view of humans as biological, psychological, social, and spiritual beings, and using multi-component psychological and religious solutions can change harmful and ineffective attitudes and beliefs, and create adaptive beliefs. In the field of cultural compatibility in psychological treatments, several studies have been conducted and the analysis of the results of these studies shows that patients who have received treatments compatible with their culture and religion show greater improvement (Dastani, Roshan, Janbozorgi, Shaeiri, & Aghaei, 2018). Koenig, King, and Carson (2012) have stated that when religious people are depressed, their beliefs may interfere with accepting and following classical treatments, especially psychotherapy. Many of these patients do not want conventional psychotherapy because they perceive it as inconsistent with their religious beliefs. Moreover, religious clients may feel that seeking treatment means that they have abandoned their faith for conventional treatments. In addition, religious individuals may feel guilty or ashamed about being depressed, and thus, avoid talking about it and seeking support (Koenig et al., 2012). Therefore, the cultural and spiritual background of people should be given special attention in the counseling and psychotherapy they receive. The findings of the current research should be considered along with its limitations. The first limitation is related to the sampling method and its implementation. The spread of the COVID-19 disease made it impossible to implement the intervention and collect data in person and through random sampling. Future researches can design the research process more precisely by removing this limitation. The second limitation of the present study was the use of a questionnaire instead of a psychiatric interview to evaluate bereavement and other variables. Future researches can use valid tools (such as structured psychiatric interviews) to examine other variables that may play a role in the effectiveness of the intervention.

Conclusion

In general, the results of the present study showed that grief counseling and God-oriented spiritual counseling are effective in reducing the symptoms of depression and suicidal thoughts in the survivors of the deceased due to COVID-19. Moreover, the findings of this research supported the greater effectiveness of God-oriented spiritual counseling compared to bereavement counseling on the symptoms of depression and suicidal thoughts in the survivors of the deceased due to COVID-19. Policymakers and mental health experts who are concerned about bereavement

can use both counseling approaches, as long as they pay attention to the needs of their target community when designing individual and community-based interventions. Furthermore, in dealing with psychological issues related to bereavement during the crisis of the coronavirus pandemic, it is better to pay special attention to the religious/religious background of individuals.

Conflict of Interests

Authors have no conflict of interests.

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The current research has been registered by the Ethics Committee of the Islamic Azad University, Karaj Branch, under the code of ethics number IR.IAU.K.REC.1401.007.

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Effects of a Continuous and Periodic Aerobic Exercise Rehabilitation Program on Depression and Anxiety in Hypertension Patients

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Quantitative Study

Abstract

Background: Depression and anxiety can lead to a variety of diseases and increase the risk of developing hypertension (HTN). The current study was conducted with the aim to assess the effects of a continuous and periodic aerobic exercise rehabilitation program on depression and anxiety in patients with HTN.

Methods: The research method was quasi-experimental and simple random sampling was used. The statistical population included 139 individuals. The selected 60 patients were divided into 2 groups, continuous and periodic aerobic exercise. These patients took part in the trial twice, 3 times a week, for 16 weeks. The Costello-Comrey Anxiety and Depression Scales with acceptable validity and reliability were used to assess the subjects' anxiety and depression before and after the training. Data were analyzed using independent and paired t-test in SPSS statistical software. Additionally, ANCOVA was used to investigate depression and anxiety parameters in greater detail.

Results: According to the t-test results, continuous and intermittent exercise programs significantly reduced the patient's anxiety and depression ($P < 0.01$). In contrast, the results of ANCOVA revealed no significant difference in anxiety and depression improvement between the 2 exercise groups ($P > 0.05$). Furthermore, in group A, the dissatisfaction component changed the most (16.4%), while the body factor changed the least (4.4%). In group B, the dissatisfaction component (16.7%) changed the most, while the behavioral factor (5.2%) changed the least.

Conclusion: Both continuous and intermittent aerobic exercise programs can assist individuals with HTN in reducing anxiety and depression.

Keywords: Depression; Anxiety; Aerobic exercise; Hypertension

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Introduction

In many countries, high blood pressure is one of the most important risk factors for cardiovascular disease (CVD), the leading cause of heart failure and stroke, and the leading cause of kidney failure (Neves et al., 2018). CVDs are the world's leading cause of death. About a third of individuals with high blood pressure are completely unaware of their condition. A person can have high blood pressure (hypertension) for years without experiencing any symptoms. Uncontrolled high blood pressure increases the risk of catastrophic illnesses like stroke and heart attack. The amount of blood pumped by the heart and the degree of resistance to blood flow by the arteries determine blood pressure (Shou, Wang, Jin, Zhu, Ren, & Wang, 2019). The higher the blood pressure, the more blood the heart pumps and the smaller the arteries are. Fortunately, high blood pressure is easily recognized, and once diagnosed, a person can work with their doctor to manage their blood pressure. Blood pressure is the force created when blood strikes the artery walls, forcing blood to flow from the heart to the rest of the body (Zupkauskiene et al., 2022).

The most accurate and practical definition of blood pressure is the point at which the advantages of therapy outweigh the hazards of going untreated. As a result, the numerical criteria for determining blood pressure are standard. Hypertension (HTN) is defined as a systolic blood pressure (SBP) of 140 mmHg or higher and a diastolic blood pressure (DBP) of 90 mmHg. The aim of the diagnosis and treatment of high blood pressure is to lower the risk of CVD and death. As a result, categorizing blood pressure levels can help in identifying patients at higher risk and choosing suitable treatment options (Dalla Vecchia & Bussotti, 2018).

Many global societies are focusing on mental health as one of the most critical challenges. The purpose of mental health is to promote mental well-being by avoiding mental disease, reducing risk factors for mental illness, and fostering a healthy environment conducive to the development of normal human interactions (Kagioglou et al., 2021). Health, according to the World Health Organization (WHO), is defined as a state of complete physical, mental, and social well-being rather than simply the absence of sickness (Bhattacharya, Shen, & Sambamoorthi, 2014).

Psychophysiological disorders are medical conditions in which emotions are assumed to play a significant role. Psychophysiology research has been limited to disorders like asthma, HTN, gastrointestinal ulcers, intestinal inflammation, and rheumatoid arthritis (Oeland, Laessoe, Olesen, & Munk-Jorgensen, 2010). Researchers are increasingly attempting to relate each illness to certain attitudes or coping mechanisms in response to stressful experiences. The most typical reaction to stressful stimuli is anxiety. Anxiety is a negative emotion that manifests itself in states such as "anxiety," "worry," "tension," and "fear" (Chia et al., 2022; Pierce, Madden, Siegel, & Blumenthal, 1993).

As an effective and useful treatment, exercise can assist individuals with HTN in preventing and treating depression, both directly and indirectly. Exercise is more successful than other treatments in treating depression and improving high blood pressure without having negative effects. Furthermore, it aids in the improvement of these patients' cardiovascular function by removing cardiovascular diseases (Jennings, 2019). Patients who exercise the following therapy are also less likely to develop disease-related risk factors (Annesi, 2022; Cheung et al., 2005).

It must be understood that focusing on the dimensions of health improves health and creates an atmosphere conducive to the development of latent abilities (Thoren, Floras, Hoffmann, & Seals, 1990). It appears that mental health should be sought first

in the components that play a vital role in its maintenance, exercise and physical activity in this context. Exercise plays such a significant role in people's mental health that the WHO coined the phrase "mobility health code" in 2002 (Winroth, Hassmén, & Stevens, 2021). A psychological alteration or experience follows every motor experience or physical change. As sports activities bring individuals closer in terms of distance and space, exercise is an effective method of physical, psychological, and social growth. Exercise improves health and physical fitness, emotional balance and stability, and self-confidence, provides a positive physical and social image, and meets friendship, competition, group strengthening, and security demands. Happiness is another aspect linked to mental health (Ginty, Carroll, Roseboom, Phillips, & de Rooij, 2013). Happiness lowers stress perception and improves a person's ability to work and work hard. In recent years, psychologists working on positive psychology have focused on potential causes of good emotions like happiness (Breeden, Gillis, Salas, & Scherrer, 2022). The emotional variables that describe the emotional experience of happiness, joy, contentment, and other good emotions, and the cognitive appraisal of satisfaction from various domains of life, which implies patience and psychological well-being, are two categories of positive psychology (Khuwaja, Lalani, Dhanani, Azam, Rafique, & White, 2010).

Exercise, according to psychiatrists, has two direct effects on mood and health; one is the release of endorphins, which cause pleasant emotions, and the other is a decrease in the level of the hormone cortisol, which is secreted by the blood pressure in the blood. Endorphins are natural painkillers, and physical activity can increase endorphin levels, resulting in pleasant feelings. In general, exercise and physical activity significantly impact the mental health and happiness of those who engage in such activities (Mahmood et al., 2019; Stanton & Arroll, 1996).

Although much study has been done on the positive effects of exercise on anxiety and even its putative mechanisms there are still many unanswered questions about problems like the type and frequency of exercise and the impacts of cultural differences (Tsai et al., 2003). Exercise's ability to reduce anxiety and sadness is influenced by several factors (Bussotti & Sommaruga, 2018). Exercise can have anti-anxiety effects on a biological level by allowing people to achieve physical fitness, changing the levels of anxiety-related neurotransmitters, affecting stress hormones, and lowering muscle tension (Jaworska, Courtright, De, MacQueen, & MacMaster, 2019). From a psychological standpoint, as a result of increasing the level of activity, the positive reinforcements conditioned by the response provide a situation that distracts the person from threatening and anxious situations and creates a foundation for increasing self-confidence and feeling good. Self-empowerment can reduce anxiety (Li et al., 2015; Yan et al., 2020).

However, research on the impact of exercise in general and specific types of vigorous exercise programs on psychological symptoms such as anxiety and depression associated with HTN is sparse. Little research has been done on the effect of exercise in general and the comparison of low-intensity and high-intensity programs, according to the findings of this study. This study was conducted with the aim to assess the impact of continuous and intermittent, almost strenuous exercise on the level of anxiety and depression in patients with HTN.

Methods

The present quasi-experimental study was performed at the Al-Yarmouk Care Center in Baghdad, Iraq, with a pretest-posttest design. Coordination was established with

the center's treatment and rehabilitation department personnel prior to starting the study procedure, and then, with patients referred for the rehabilitation program from July to November 2021. Patients who were able to participate in 48 sessions (16 weeks) of rehabilitation were among those who were invited to take part in the study (60 patients). A simple random sample was selected from a statistical population of 139 patients. A sports physiologist who recommended exercise regimens watched and prescribed more than 450 individuals with HTN for 12 months before the trial to fully prepare them for it (Johansen, Holmen, Stewart, & Bjerkeset, 2012).

The specialized doctor voluntarily picked 60 patients (16 men and 44 women) following the call and initial clinical evaluations (history, previous medical history, clinical examinations, diagnostic tests, and exercise tests). These patients were separated into 2 groups according to the type of activity. The study inclusion criteria included absence of a mobility barrier, the individual's willingness to participate, and an ejection fraction of higher than 30%. The absence of patients from more than 3 sessions of the exercise program and their lack of interest, during which none of the subjects met the exclusion criteria, was the physician's diagnosis**.** The questionnaire was completed without the participants' names. Moreover, the participants were also assured that their identities would not be revealed.

Data collection: Before beginning the exercise program, all subjects participated in a joint training session based on a pre-determined plan for rehabilitation program participation, and the study method was thoroughly explained. Then, 60 patients who met the inclusion criteria were chosen and divided into 2 groups. Continuous aerobic activity was performed in group A (30 individuals; 8 men and 22 women) and periodic aerobic exercise was performed in group B (30 people; 8 men and 22 women). The number of subjects required to obtain the desired statistical results were calculated based on previous research. Table 1 shows the demographic characteristics of the research groups.

Continuous aerobic exercise program: This progressive program was developed using the principles of exercise design, the guidelines of the American College of Sports Medicine, and research, and was based on the individual's starting capacity and capacity after the exercise test. This program was created to gradually increase the workload, diversify the program, and tailor the program to each individual's needs (to increase performance capacity). Based on the program presented in table 1, the continuous program was built and changed using two devices, a tape recorder and a manual ergometer. Patients initially ran on a revolving bar, then had their blood pressure taken, and then, resumed work on a manual ergometer, and ultimately, exercised on a stationary bicycle.

Table 1. Comparison of frequency and demographic characteristics of research groups

Demography variables		Group A		Group B	
		Number	Percentage	Number	Percentage
Gender	Male	8	27	8	27
	Female	22	73	22	73
Marital status	Single	5	17	7	24
	Married	25	83	23	76
Age category (year)	< 40	7	24	9	29
	41-50	10	33	11	38
	50-65	13	43	10	33
Education level	High school	14	47	9	29
	Diploma	7	24	10	33
	Undergraduate	8	27	8	27

Table 2. Description of a continuous exercise program

Device type	Variables	Exercise sessions							
		1-6	7-12	13-18	19-24	25-30	31-36	37-42	43-48
Revolving bar	Intensity (%)	70	72	74	76	78	80	82	84
	Time (min)	10-13	13-16	16-19	19-21	21-24	24-27	27-30	30-33
Manual ergometer	Intensity (watt)	30	32	34	36	38	40	42	44
	Time (min)	10-13	13-16	16-19	19-21	21-24	24-27	27-30	30-33
Stationary bike	Intensity (watt)	20	22	24	26	28	30	32	34
	Time (min)	10-13	13-16	16-19	19-21	21-24	24-27	27-30	30-33

Periodic aerobic exercise program: The exercise regimen for group B was based on that presented in table 1. It was similar to that of the program presented by Wisloff et al. and the American College of Sports Medicine's criteria. Each patient's record was documented using the sports control sheet based on the patient's initial condition and the exercise test results that were recorded on the patient's file, heart rate range and level, and intensity or speed of exercise equipment. Depending on the conditions, patients slept for 5 to 15 minutes between use intervals.

Anxiety and depression assessment: The Costello-Comrey Depression and Anxiety Scales (1967) are used to assess sadness and anxiety. Subjects determine their agreement with each item on a 5-point Likert scale ranging between 0 and 25. The emotional, cognitive, behavioral, and physical components are studied for anxiety, and, elements such as disappointment, disability, absence, and helplessness are investigated for depression (Costello & Comrey, 1967). This scale's validity and reliability have been studied and confirmed in the study by Ghorbani, Bing, Watson, Davison, and Mack (2002). Cronbach's alpha coefficients of the anxiety and depression scales were 0.78 and 0.91, respectively.

Terms and conditions of the test: Patients' blood pressure and heart rate were measured at the start and end of the program to assess their physical and physiological state. The patient's ECG was printed simultaneously as the exercise intensity was reduced in the event of abnormality and acute abnormality during exercise. In addition, the program was terminated if necessary based on the patient's health and in the event of symptoms such as chest pain, dizziness, or nausea, and the patient was sent to a rehabilitation physician along with the file and history of that session, and, if necessary, a cardiologist. Each patient followed the previously given directions and inserted leads in 3 different locations, which were then placed on the device and connected to the remote control device, allowing them to do sports activities. Factors such as ECG, anomalies occurring during exercise, and heart rate were managed during the exercise test using a remote control system (Hamer, 2006).

Changes in blood pressure, heart rate, and device speed in 5, 10, 15, and 20 minutes were recorded and compared with previous sessions to ensure program progress and, if necessary, alter the intensity and length of the program. The specific benefits of the sports program were also addressed before engaging in the program during the sessions to increase patients' desire to participate in the program, change their inactive patterns, and improve their attitude toward sports activities.

Data processing method: The essential characteristics of the patients were described using descriptive statistical methods (mean and standard deviation). The Kolmogorov-Smirnov test was used to assess the normality of the variable distribution. The paired t-test was used to assess the influence of sports activity in sports groups. The independent t-test was used to compare and contrast the groups. Analysis of covariance (ANCOVA) was employed to examine depression-related and anxiety-related parameters in greater depth.

Table 3. Description of a periodic exercise program

Device type	Variables	Exercise sessions							
		1-6	7-12	13-18	19-24	25-30	31-36	37-42	43-48
Revolving bar	Intensity (%)	70	73	76	79	82	85	88	91
	Time (min)	10-12	12-14	14-16	16-18	18-20	20-22	22-24	24-26
Manual ergometer	Intensity (watt)	30	33	36	39	42	45	48	51
	Time (min)	6-8	8-10	10-12	12-14	14-16	16-18	18-20	20-22
Stationary bike	Intensity (watt)	20	23	26	29	32	35	38	41
	Time (min)	4-6	6-8	8-10	10-12	12-14	14-16	16-18	18-20

SPSS statistical software (version 19; SPSS Inc., Chicago, IL, USA) was used to perform all statistical calculations. All tests had a significance level of less than or equal to 0.05.

Results

Table 3 contains a list of the subjects' physical characteristics. A paired t-test and an in-group comparison of means before and after the exercise program revealed that both training approaches significantly affected anxiety and depression in hypertensive patients (Table 4).

In addition, no statistically significant differences were observed between the groups before the test. However, the assessment of anxiety and depression after the program revealed a significant difference in these variables. Moreover, there was no significant difference between the two groups in terms of the absolute quantity of anxiety and depression changes (first-stage anxiety and depression, and second-stage anxiety and depression). In addition, the percentage of reduction in anxiety and depression following the completion of the two training methods was nearly identical. Based on the results of ANCOVA, continuous and periodic interventions are associated with improving patients' health in each of the parameters of depression and anxiety ($P < 0.01$) (Table 5). There were no statistically significant differences between the two groups' results ($P > 0.01$).

Table 6 compares the anxiety and depression factor scores for each group.

Figure 1 depicts the amount of change in the values of each factor following the program for group A. However, the dissatisfaction factor changed the most (16.4%), while the body factor changed the least (4.4%).

Figure 2 depicts the amount of change in the values of each factor following the program for group B. Furthermore, the disappointment component changed the most (16.7%), while the behavioral factor changed the least (5.2%).

According to the results, it seems that the factors of depression have changed more than the factors of anxiety.

Discussion

The current study was conducted with the aim to determine the impact of continuous and periodic aerobic exercise on anxiety and depression in hypertensive patients.

Table 4. Comparison of pretest and posttest anxiety and depression scores within groups

Variable	State	Group A (mean ± SD)	Group B (mean ± SD)	P
Anxiety	Pretest	83.07 ± 5.09	87.49 ± 5.24	0.014
	Posttest	77.23 ± 3.89	81.93 ± 4.76	
Depression	Pretest	74.39 ± 4.26	76.62 ± 4.83	0.001
	Posttest	68.81 ± 3.62	69.43 ± 3.86	

SD: Standard deviation

Table 5. ANCOVA for each of the parameters of depression and anxiety

Components	Evaluation variables	Total squares	Degrees of freedom	Mean squares	F	P
Emotional	Intervention	47.26	1	47.26	9.16	0.002
	Group	93.74	1	93.74	36.54	0.201
	Error	47.32	22	2.15		
	Total	982.27	30			
Cognitive	Intervention	45.17	1	45.17	11.09	0.001
	Group	90.48	1	90.48	43.71	0.673
	Error	59.38	22	2.70		
	Total	1329.14	30			
Behavioral	Intervention	36.94	1	36.94	9.43	0.009
	Group	87.61	1	87.61	31.74	0.094
	Error	48.18	22	2.19		
	Total	2439.47	30			
Body	Intervention	34.67	1	34.67	6.41	0.007
	Group	79.14	1	79.14	32.09	0.076
	Error	41.27	22	1.88		
	Total	3749.35	30			
Disappointment	Intervention	35.12	1	35.12	13.84	0.004
	Group	97.16	1	97.16	54.19	0.140
	Error	52.09	22	2.37		
	Total	2194.67	30			
Disability	Intervention	29.07	1	29.07	8.43	0.011
	Group	128.63	1	128.63	56.49	0.219
	Error	67.52	22	3.07		
	Total	2649.37	30			
Absence	Intervention	28.86	1	28.86	5.79	0.001
	Group	94.73	1	94.73	21.60	0.0712
	Error	43.16	22	1.96		
	Total	1342.76	30			
Helplessness	Intervention	22.04	1	22.04	4.31	0.004
	Group	79.14	1	79.14	18.64	0.117
	Error	34.27	22	1.56		
	Total	794.23	30			

Findings revealed that exercise and mental health have a good relationship (Crombie, Cisler, Hillard, & Koltyn, 2021).

Table 6. Comparison of the scores of different anxiety and depression factors

Variable	State	Group A (mean ± SD)	Group B (mean ± SD)	P-value
Emotional	Pretest	46.05 ± 3.26	50.62 ± 3.47	0.017
	Posttest	42.28 ± 3.01	45.83 ± 3.17	
Cognitive	Pretest	48.34 ± 4.09	54.19 ± 4.27	0.006
	Posttest	43.51 ± 3.21	48.52 ± 4.16	
Behavioral	Pretest	42.61 ± 3.16	45.18 ± 3.46	0.041
	Posttest	38.94 ± 2.87	42.81 ± 3.04	
Body	Pretest	43.19 ± 3.29	44.53 ± 3.38	0.037
	Posttest	41.28 ± 2.73	42.17 ± 2.83	
Disappointment	Pretest	37.41 ± 2.64	39.73 ± 2.81	0.011
	Posttest	31.29 ± 2.43	33.08 ± 2.59	
Disability	Pretest	32.55 ± 2.49	31.49 ± 2.27	0.024
	Posttest	28.67 ± 2.09	27.93 ± 1.86	
Absence	Pretest	35.71 ± 2.58	36.97 ± 2.78	0.037
	Posttest	31.49 ± 2.23	31.70 ± 2.29	
Helplessness	Pretest	26.14 ± 2.16	27.63 ± 2.24	0.0.009
	Posttest	23.59 ± 1.72	25.19 ± 2.06	

SD: Standard deviation

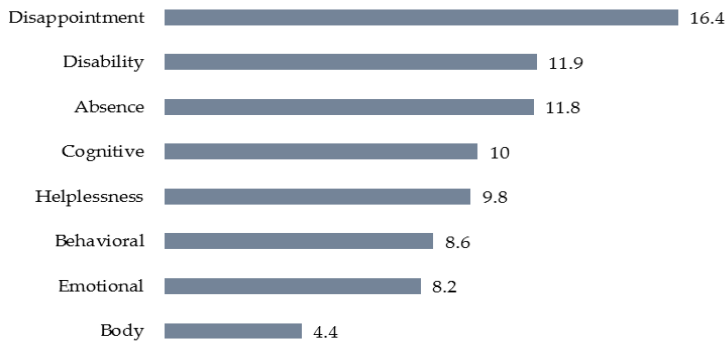

Figure 1. Changes in group A parameters as a percentage in the posttest

The findings of the current study point to a link between physical activity and mental well-being. In other words, exercise causes a good attitude and, as a result, increases a person's satisfaction with life through influencing the type of sentiments and emotions a person experiences (Yang et al., 2022).

According to the t-test results, continuous and intermittent aerobic exercise significantly reduced anxiety and depression in hypertensive patients ($P < 0.01$). The results indicated that the type and intensity of exercise had little impact on the outcomes ($P < 0.01$). According to the ANCOVA results, there was no significant relationship between the groups ($P > 0.05$); the groups achieved similar results despite participating in different exercise regimens. While ANCOVA demonstrated that the intervention reduced anxiety and depression in these patients, the effect was insignificant ($P < 0.01$). In group A, disappointment changed the most (16.4%), while body changed the least (4.4%). In group B, disappointment changed the most (16.7%), while behavior changed the least (5.2%).

Numerous studies have been conducted in this field and have reported findings consistent with the current investigation findings. Prugger et al. (2017) demonstrated that mental health issues harm the physical activity of heart patients and patients with coronary heart disease (CHD) and severe symptoms of depression engage in very little regular exercise.

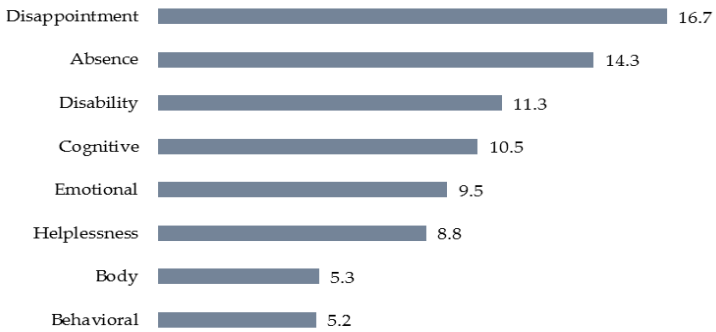

Figure 2. Changes in group B parameters as a percentage in the posttest

Therefore, severe depressive symptoms may prevent CHD patients from exercising regularly. Strohle (2009) has demonstrated that the beneficial effects of exercise on anxiety and depression are on the rise. However, clinical applications such as psychological and pharmacological approaches are still in their infancy. In addition, specifying the impact of the type, intensity, and the number of cycles of more effective sports activities on psychological aspects will aid in maximizing the effectiveness of exercise programs. Studies have shown that moderate-intensity cardiovascular exercise positively affects the depressive behavior of sedentary adults. Several studies have demonstrated that exercise is more effective and durable than other treatments. Counseling and exercise improved patients' anxiety and depression in the first year compared to the control group, but the exercise had more lasting effects and no adverse effects. Additionally, the exercise program improved the patient's general health, health-related factors, and health. Raja Koplan et al. demonstrated that blood flow-dependent vasodilation was significantly reduced in depressed patients compared to a matched control group. Although Chrapko, Jurasz, Radomski, Lara, Archer, and Le Melledo (2004) showed that nitric oxide levels and nitric oxide synthase activity were significantly lower in healthy depressed subjects than in the non-depressed control group, vascular activation disorders may be associated with depression. Additionally, Lesperance, Frasure-Smith, Theroux, and Irwin (2004) demonstrated that the amount of soluble intracellular adhesion molecule in patients with acute and depressed coronary syndromes was significantly higher than in non-depressed individuals; this indicates chronic activation of endothelial tissue in patients with acute coronary syndrome.

Although the mechanism by which regular exercise improves mental health is unknown, several theories have been presented in this regard. The theories of distraction and growing mass communication have been offered from the standpoint of psychological causes, and the idea of endorphins has been proposed for physiological mechanisms. According to the findings of this study, regular exercise can be a factor in both physical and mental health, as well as one of the approaches to regulating and treating anxiety and depression in vulnerable groups.

In summary, the outcomes of this study and other studies suggest that exercise can reduce anxiety and depression symptoms at any level of hypertension severity and enhance patients' mental health in general. There is no evidence that the effects of type (constant, periodic, resistance, aerobic, etc.) and intensity (low, moderate, and severe) on psychological aspects differ. However, it has been suggested that long-term continuous exercise accompanied by endorphin release and euphoria has more positive psychological effects.

Conclusion

The effects of continuous and periodic aerobic exercise were not shown to be significantly different in this study; in other words, both continuous and periodic exercise showed anti-anxiety effects. Overall, the findings of this study support the anti-anxiety effects of both continuous and intermittent exercise in lowering anxiety and demonstrate that exercise can be utilized as a useful method to reduce anxiety. This study has methodological flaws and limitations that should be addressed in future studies. The small sample size and a lack of bio-physiological and biochemical assessments are examples of these flaws. Other limitations of this study include the rigorous examination of the mechanism of impact of exercise and psychological evaluations (to investigate the psychological mechanism of the effect of exercise

accurately), long-term follow-up of anti-anxiety effects, and so on. Future studies will be required to elucidate the major mechanisms of exercise's anti-anxiety effects. It is suggested that future studies analyze and compare the effects of aerobic and anaerobic exercise on anxiety and depression reduction. Assessments in other groups with various diseases should also be carried out. Future studies should investigate the impact of the length of exercise programs, combined exercise interventions, and relaxation activities on mental health issues. Furthermore, it is suggested that the efficacy of exercise therapy, in conjunction with other psychotherapeutic interventions, be investigated in psychotherapy clinics among patients with mental problems.

Conflict of Interests

Authors have no conflict of interests.

Acknowledgments

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Effectiveness of the Compassion-Focused Therapy on Self-Criticism and Marital Intimacy among Couples

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Quantitative Study

Abstract

Background: The present study aimed to investigate the effectiveness of compassion-focused therapy (CFT) on self-criticism and marital intimacy among couples. A quasi-experimental pretest-posttest design with a control group was implemented.

Methods: The research method was quasi-experimental with pretest-posttest and control group design. The population consisted of all couples that volunteered to participate in the study in Mashhad, Iran, in 2021, and the sample included 30 individuals (15 people in each group). The participants were selected using the volunteer sampling technique and were randomly assigned to the experimental and control groups. The experimental group received 8 sessions of the CFT intervention, while the control group did not receive any psychotherapeutic intervention. The instruments implemented in the study included the CFT package, the Levels of Self-Criticism Scale (LOSC), and the Marital Intimacy Scale. The data of the study were analyzed using descriptive statistics, while the inferential data were analyzed by the multivariate analysis of covariance using SPSS software.

Results: There were significant differences between the experimental and control groups in terms of self-criticism (F = 11.03, P = 0.003) and marital intimacy (F = 11.91, P = 0.003). In other words, implementing the CFT intervention reduced self-criticism and increased marital intimacy among couples.

Conclusion: It was concluded that counselors, therapists (in the fields of couple therapy, family, and individual) and other specialists in mental health could implement the CFT intervention to reduce self-criticism and increase marital intimacy among couples.

Keywords: Couples therapy methods; Female; Humans; Interpersonal relations; Male; Marital therapy; Psychological tests; Psychometrics; Self-disclosure

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Introduction

Intimacy is a component of interpersonal relationships that includes either emotional or physical forms (Wong, Hall, Justice, & Hernandez, 2020). Intimacy means a close and personal relationship where an individual feels a sense of belonging to another individual (the other parties to a relationship) (Mashek & Aron, 2004). An actual intimate relationship is formed when there is the capacity for dialogues and mutual interactions, clarity, and sensitivity towards the other party's needs (Mashek & Aron, 2004). Maintaining intimacy in relationships for longer periods requires convenient emotional and interpersonal awareness concerning the other party to a relationship (Aronson, 2003). Underdeveloped intimacy skills result in the formation of quick and extremely close bonds that break down the boundaries of relationships and make it difficult to maintain them (Bershad, Haber, & Prentice-Hall, 1997).

Self-criticism refers to people's analyses of their performance in a negative way that disrupts their identities (Blatt & Luyten, 2011). Self-criticism is among the most prevalent properties of psychological impairments (Gilbert, McEwan, Gibbons, Chotai, Duarte, & Matos, 2012). Shame and self-criticism are related to a wide range of psychological issues like various types of depression, substance abuse, diet disorders, social anxiety, and psychosis (Gilbert & Irons, 2008). Thus, almost 70% of various auditory hallucinations have critical and adversarial content (Gilbert, 2010). Self-criticism in the relationships between married couples predicts reduced collaboration and agreement and increased criticism (Santor, Pringle, & Israeli, 2000). Self-criticism is a defense mechanism that has particular functions and complexities in the compassion-focused therapy (CFT) intervention (Gilbert, 2010).

Various solutions have been proposed to increase marital intimacy. One of them is to help married couples respect and love themselves and reduce their self-criticism. The CFT intervention dates back to thousands of years ago and has integrated various scientific approaches like (among others) evolutionary psychology, emotional neuroscience, attachment theory, behavioral sciences, cognitive-behavioral therapy, and the exercises of mindfulness and compassion to understand humans' conditions (Kolts, Hayes, & Gilbert, 2016). Something that every approach to psychotherapy shares is that it should be performed sympathetically, compassionately, respectfully, kindly, and in a supporting manner (Gilbert, 2010). The CFT is defined as being sensitive to suffering to alleviate and prevent it (Kolts et al., 2016). Self-compassion is an approach where a positive emotional attitude is adopted toward oneself, and a judgment-free stance is taken against personal weaknesses and shortcomings and the difficult moments of life (Zhang et al., 2019). Compassion has six main components where 3 components indicate positive aspects (kindness or compassion for oneself, self-consciousness, and shared humanity), while the remaining 3 components point to negative aspects (self-judgment, isolation, and over-differentiation) (Gilbert, 2009). The fear of compassion (self-compassion and receiving compassion from others) is related to self-criticism, depression, anxiety, and stress (Gilbert et al., 2012).

Based on the above discussions and the necessity of working on married couples, it is still unknown if the CFT intervention is effective on marital intimacy and couples' self-criticism. The current study aimed to answer this question.

Methods

The current study used a quasi-experimental with pretest-posttest and control group design. The population included all couples who volunteered to take part in the

study and fulfilled the inclusion criteria. Then, 30 participants called by announcement in Mashhad, Iran, in 2021, were selected using the volunteer sampling method and were randomly assigned into an experimental group (15 participants) and a control group (15 participants). Inclusion criteria were: 1) high scores on the Levels of Self-Criticism Scale (LOSC) and low scores on the Marital Intimacy Scale, 2) lack of involvement in other psychological treatments and interventions, 3) being at least 18 years old, and 4) volunteering to take part in the study. Exclusion criteria were: 1) absence in more than two treatment sessions, and 2) receiving other psychological interventions.

Procedures: The participants took the pretest where the LOSC and the Marital Intimacy Scale were implemented. Then, the experimental group received 8 ninety-minute sessions of the CFT intervention in the group format, while the control group was placed on the waiting list. The posttest was given after the CFT sessions were over. Table 1 shows the summary of compassion-oriented treatment sessions.

Table 1. Summary of compassion-oriented treatment sessions

Therapy summary	Session title	Session
First	Getting to know the basics of therapy	The first session aims to provide a general knowledge of the therapy basics. It includes the pre-test, the introduction of members and therapist, determination of therapy schedules, and broad familiarity with essentials of the compassion-focused therapy, exploring the notions of self-criticism, marital intimacy, and compassion.
Second	Getting to know the components of compassion and self-criticism	The second session aims to provide an overview of the components of compassion and self-criticism. It explains compassion components and investigates the compassion of group members and the characteristics of compassionate individuals.
Third	Teaching self-compassion	The third session seeks to teach self-compassion to the group members. It boosts the acceptance and warmth toward oneself, understanding and comprehension of others' problems, and attention to one's mental health.
Fourth	Getting to know oneself and factors influencing self-criticism	The fourth session seeks to explain further the self and the factors influencing self-criticism. It aims to encourage the members to know themselves and explore their personalities as individuals with or without compassion, develop self-compassion values and sympathy toward others, accept errors and mistakes, and forgive oneself for committing these mistakes.
Fifth	Further expanding compassion in life	The fifth session aims to revisit and expand compassion in the daily life of the members. It involves mental development, the notion of compassion, teaching understanding, accepting issues and likely changes, and confronting the challenges raised by these changes.
Sixth	Teaching compassion expression methods toward oneself and others	The sixth session teaches the compassion expression methods toward oneself and others. The session includes exercises to establish compassionate mental structures and use this concept in the daily lives of the members toward oneself and others.
Seventh	Investigating compassion expression methods	The seventh session examines the compassion expression methods. It teaches writing compassionate letters to oneself and others and recording and writing down actual compassion-focused situations and how the individual acts.
Eighth	Evaluating and employing compassion, discussion, and conclusion	The eighth session aims to evaluate and employ the function of compassion. It guides the group members to use the notion of compassion in an applied way in daily life. It also provides a discussion, conclusion, questions, and answers with the group members.

Ethical issues: The participants provided informed consent in accordance with the procedures outlined by the institutional review board; they were informed that they could withdraw from the experiment at any time. The control group received the intervention after the termination of the research.

LOSC: The instrument was developed by Thompson and Zuroff (2004) and includes 22 items to investigate internal self-criticism and comparative self-criticism. The reliability and validity of the scale were investigated by Thompson and Zuroff (2004) and Yamaguchi and Kim (2013), and its Cronbach's alpha coefficient was determined at 0.90. Moreover, the scale was translated into Persian by Shariati et al. (2017), and its reliability and validity were investigated (Cronbach's alpha coefficient = 0.87).

The Marital Intimacy Scale: The instrument was developed by Walker and Thompson (1983) and consists of 17 items that investigate intimacy among married couples. Walker and Thompson (1983) evaluated the reliability and validity of the scale, and its Cronbach's alpha coefficient was determined at the range of 0.91-0.97. Moreover, Sanai Zaker et al. (2000) translated the instrument into Persian and investigated its reliability and validity with the Cronbach's alpha coefficient equal to 0.96.

The CFT intervention package and analyzing method: The instrument was developed according to Gilbert's theory (Gilbert, 2010). The obtained results were analyzed using the multivariate covariance analysis in SPSS software (version 26, IBM Corporation, Armonk, NY, USA).

Results

The descriptive analysis of the demographic variables of the study showed that the mean and standard deviation (SD) of age of the participants in the experimental and control groups were 34.30 ± 5.84 and 34.80 ± 6.23, respectively. The mean and SD values of marital intimacy and self-criticism obtained in the two groups are presented in table 2.

Two assumptions including the covariance matrix equality and the normality of the variables were investigated using Box's M test and Shapiro-Wilk test, respectively, and the results confirmed them ($P < 0.05$). Thus, the multivariate covariance analysis was found to be a convenient analytical tool in the current study. The results of the multivariate covariance analysis obtained for the experimental and control groups are as follows: Wilk's lambda: value = 0.686, statistics = 5.73, assumption degree of freedom (df) = 2, error df = 25, P = 0.009, eta-squared = 0.314.

According to findings, a significant difference was observed between the components and intimacy in terms of linear combination. In other words, the CFT intervention had a significant influence on the composite dependent variable (intimacy and self-criticism) in the experimental group.

According to table 3, a significant difference was observed between the experimental and control groups in terms of the mean values obtained for marital intimacy and self-criticism.

Table 2. The mean and standard deviation (SD) of marital intimacy and self-criticism

Variable		Posttest		Pretest	
		Mean ± SD	Participants	Mean ± SD	Participants
Marital intimacy	Experimental	36.47 ± 16.72	15	54.40 ± 17.48	15
	Control	53.67 ± 7.79	15	60.13 ± 13.11	15
Self-criticism	Experimental	46.87 ± 18.02	15	63.20 ± 17.93	15
	Control	62.13 ± 9.87	15	65.53 ± 15.33	15

SD: Standard deviation

Table 3. A comparison of the two groups in terms of intimacy and self-criticism

Source	Variable	SS	df	MS	F	P-value	Effect size
Group	Marital intimacy	1580.07	1	1580.07	11.91	0.002	0.314
	Self-criticism	1586.12	1	1586.12	11.03	0.003	0.298

SS: Sum of squares; df: Degree of freedom; MS: Mean squares

In other words, the effect sizes of marital intimacy and self-criticism in the experimental group were 0.314 and 0.298, respectively, and they were considered high values.

Discussion

The aim of this research was to study the effectiveness of CFT on self-criticism and marital intimacy of couples. The findings of the current study were in line with the findings of Brennan et al. (2014), Boersma et al. (2015), Beaumont et al. (2016), Irons and Lad (2017), Cuppage et al. (2018), Krieger et al. (2019), Rayner et al. (2021), and Petrocchi et al. (2020), which showed the effectiveness of the CFT intervention on reducing self-criticism.

Boersma et al. (2015) believed that using the set of skills presented in the CFT approach reduced the rates of shame, self-criticism, and isolation. Moreover, Irons and Lad (2017) found that the CFT and cognitive-behavioral approaches reduced anxiety, depression, avoidant behavior, and post-traumatic disturbing thoughts, while it increased self-compassion (Irons & Lad, 2017). Tirch (2010) believed that the CFT intervention reduced self-criticism and psychological issues in people by increasing their self-consciousness, unconditional acceptance, sympathy, and constant attention to internal feelings. Brennan et al. (2014) found that the CFT technique made people aware of the aggressive and violent nature of self-criticism and let them face the disturbing events of their lives more gently and approvingly by using the techniques of self-consciousness and empowerment (Brennan, Emmerling, & Whelton, 2014). Neff and McGehee (2010) believed that the CFT intervention could encourage people to be more courageous and stop the faulty cycle of self-criticism. Diedrich et al. (2014) found that self-compassion regulated emotions and feelings and reduced negative emotions and feelings. Gilbert (2014) believed that self-compassion resulted in supportiveness, better understanding, kindness, and more helpfulness to others (Gilbert, 2014), and such factors enhanced the quality of interpersonal relationships and strengthened their intimacy (Bagarozzi, 2014). According to Gilbert, some actions and components of the CFT intervention like tolerating disturbances and taking care of well-being in addition to the skills adopted in the model including imagery, argument, and compassionate attention reduced clients' self-criticism (Gilbert, 2014).

The findings concerning the effectiveness of the CFT intervention on marital intimacy were in line with Lotfi et al. (2021), Shojaei Vazhnany et al. (2020), Araghian et al. (2020), Zahedi (2019), and Yousefi and Karimnezhad (2018), which confirmed the effusiveness of the CFT intervention on increasing marital intimacy.

Lotfi et al. (2021) found that adopting the solutions proposed in the CFT approach increased distinction and reduced marital conflicts among married couples. Shojaei Vazhnany et al. (2020) showed that implementing the techniques of the CFT intervention improved intimacy among couples and regulated their emotions. Araghian et al. (2020) concluded that the CFT approach had a significant effect on increasing the mental health components of families like the quality of interpersonal

relationships and the toleration of disturbance. Zahedi (2019) showed that the CFT-based strategies reduced marital conflicts and increased intimacy. Yousefi and Karimnezhad (2018) believed that the approach improved family relationships and increased forgiveness and intimacy among married couples. Jacobson et al. (2018) concluded that people with lower levels of self-compassion prioritized their needs over that of their spouses, and this caused dissatisfaction with marital relationships and increased conflicts in them. Yarnell and Neff (2013) concluded that compassionate attitudes caused people to consider others' needs and requests, and this reduced interpersonal conflicts and increased intimacy among human beings. Gilbert (2014) pointed to actions like the lack of judgment, sympathy, sensitivity, and empathy as the components of the CFT approach that could be combined with various skills like argument, attention, and compassionate behavior to increase intimacy among people (Gilbert, 2014). Those who have self-criticism do not love themselves and have an external locus of control correlating negatively with various aspects of psychopathology including interpersonal problems (Bagherian, Ahmadzadeh, Baghbanian, 2009).

Conclusion

Self-compassion helps people to learn loving each other and especially themselves. The limitations of this study were not selecting samples randomly, lack of comparison group, lack of follow-up phase, and using self-report instruments. We suggest the future researchers to carry out a study without these limitations to give us more precise results.

Conflict of Interests

Authors have no conflict of interests.

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The Prevalence of Anxiety and its Associated Factors among Medical Interns during the COVID-19 Outbreak in Iran

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Quantitative Study

Abstract

Background: Since the Coronavirus disease 2019 (COVID-19) pandemic outbreak, medical personnel have undergone a considerable amount of physical and mental pressure. Medical interns (MIs) are a distinct population of healthcare workers. In Iran, MIs refers to senior medical students who are undergoing their clinical training. We aimed to determine the prevalence of anxiety due to COVID-19 among MIs and identify personal factors associated with anxiety.

Methods: A cross-sectional study was carried out during April 18th to 24th, 2021. An online questionnaire containing a demographic characteristics questionnaire and the Corona Disease Anxiety Scale (CDAS) was sent to all of the 679 MIs of Shahid Beheshti University of Medical Sciences, Iran, through WhatsApp© messenger and 420 individuals (62% response rate) were enrolled in the study voluntarily. Independent t-test, one-way ANOVA, and Tukey's HSD post hoc test were conducted using SPSS software to identify the predictive factors for anxiety.

Results: The results showed that 70.2% of the participants had no or mild anxiety, 25% had moderate, and 4.8% had severe anxiety. The most significant factors associated with anxiety were female gender ($P < 0.001$) and living with parents ($P < 0.01$). However, there was no significant difference between single and married groups ($P = 0.42$).

Conclusion: It is suggested that medical universities and the government collaborate to provide an adequate psychological service for MIs, focusing on female interns who are living with their family members.

Keywords: Anxiety; Coronavirus; Mental Health; Psychology; Students

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Introduction

The novel corona virus (2019-nCoV) pneumonia was first reported in Wuhan, China, in late December 2019 (Lu et al., 2020). It rapidly spread around the world. On March 11, 2020, the World Health Organization (WHO) declared the situation a global pandemic (World Health Organization, 2020a). Iran was one of the countries with a high prevalence of COVID-19 (World Health Organization, 2020b). Since the outbreak, Iran's government attempted to extend the quarantine and prevent the further spread of the virus. However, the number of patients grew at an accelerating rate.

In addition to the physical symptoms of the COVID-19, its psychological effects should also be taken into consideration. It has been documented that the mental impacts of previous infectious outbreaks, such as severe acute respiratory syndrome (SARS), have been longer lasting than their physical impacts (McAlonan et al., 2007).

Health care providers are one of the most vulnerable populations during epidemics (Guerrero et al., 2021). Among 545 COVID-19 frontline physicians in Morocco, 370 individuals showed generalized anxiety symptoms most of whom were women (Ouazzani Housni et al., 2022). Another survey on medical staff exposed to COVID-19 patients demonstrated a considerable rise in their anxiety level and poor sleep quality. Female gender and young age were identified as independent risk factors of anxiety in this study (Alboghdadly, Saadh, Kharshid, Shaalan, & Alshawwa, 2022). Lang, Liu, He, Lv, and Xu (2020) reported working hours as another risk factor for anxiety in medical staff during the COVID-19 pandemic.

Medical interns (MIs) are a distinct group of healthcare workers that faced extraordinary pressure and psychological disorders during this sudden onset life-threatening situation. In Iran, medical internship refers to the last 2 years of medical school in which MIs start their clinical training. The COVID-19 pandemic had unfavorable effects on medical education. Moreover, MIs are frontline workers at a high risk of exposure to the infection. Studies have shown that despite health needs in a substantial proportion of medical students, they are unwilling to seek help especially in mental health issues including anxiety (Moreira de, Moreira, & Telles-Correia, 2018). However, It is known that medical students are at greater risk of anxiety disorder in comparison to their age-matched peers in the general population (Keyvanfar et al., 2022). Although, anxiety is a common mental disorder, it has not received much attention and is mostly unrecognized and undertreated (Willgoss, Goldbart, Fatoye, & Yohannes, 2013). Anxiety can impair MIs' functions and prevent the provision of an efficient and safe medical care to patients.

There have been few reports on medical students' psychological status in Iran at the beginning of the COVID-19 pandemic (Miri, Razavi, & Mohammadi, 2021; Nakhostin-Ansari, Sherafati, Aghajani, Khonji, Aghajani, & Shahmansouri, 2020). To the best of our knowledge, no study has been conducted exclusively on the MI population. Thus, our primary aim was to investigate and analyze the prevalence of anxiety due to COVID-19 in a sample of MIs in 1 Iranian medical school. Our secondary goal was to identify personal factors associated with anxiety in order to detect it and provide timely assistance to at risk interns.

Methods

A cross-sectional survey was conducted from April 18th to 24th, 2021 (14 months after confirmation of the first case of COVID-19 by Iranian official authorities) among MIs of Shahid Beheshti University of Medical Sciences, Iran, using an online questionnaire. Respondents who were current MIs of the university, answered all of

the questions, and had access to the Internet and WhatsApp© messenger were included in the study. This study was approved by the Ethics Committee of Shahid Beheshti University of Medical Sciences.

Questionnaire: The first section of the study questionnaire was a demographic characteristics questionnaire including questions on factors such as gender, marital status, and living status (living in their parents' home, in the dormitory, or alone). The second section of the questionnaire was the Corona Disease Anxiety Scale (CDAS). The CDAS is applied for the assessment of psychological and physical symptoms of anxiety related to the COVID-19 pandemic. This tool has been examined in the Iranian society and has shown a good internal consistency (α = 0.91), reliability, and validity (Alipour, Ghadami, Farsham, & Dorri, 2020). The CDAS consists of 18 items scored on a 4-point Likert scale ranging from 0 to 3 (0 = never, 1 = sometimes, 2 = most of the time, 3 = always). Thus, the sum of the items for each individual was considered as the anxiety score which ranged from 0 to 54. Based on their anxiety score, the participants were divided into the three categories of no to mild (0-16), moderate (17-29), and severe (30-54) anxiety.

Participants: The total number of the target population was 679 individuals. Due to the corona virus pandemic limitations and social distancing, the questionnaires were sent to all of the MIs through WhatsApp© messenger and the participants voluntarily enrolled online. All participants were assured that their identity would remain confidential. In total, 420 (62% response rate) completed questionnaires were collected and analyzed.

Data analysis: SPSS software (version 25.0; IBM Corp., Armonk, NY, USA) was used to conduct the statistical analysis. Student's t-test was utilized to explore which demographic characteristics influenced anxiety among the participants. $P < 0.05$ was considered as statistical significance. One-way ANOVA and Tukey's HSD post hoc test were performed to evaluate the significant associations between the living status and CDAS score. The Pearson correlation coefficient was used to assess the association between stressors and anxiety intensity categories.

Results

The responses of 420 MIs [196 (47%) men and 224 (53%) women] were received. The demographic information of participants is summarized in table 1. Their ages ranged from 20-36 years with a mean of 25.07 (SD = 1.55) years. Moreover, 340 (80%) participants were single. In addition, most of them [247 (59%)] were living at their parents' home, 100 (24%) MIs were living independently in their own home, and 73 (17%) in the dormitory.

Table 1. Demographic characteristics and the results of independent t-test and one-way ANOVA analysis among medical interns

Variable	Sample (n = 420)	Percentage (%)	Anxiety scale	
			Mean ± SD	P-value
Gender				< 0.01
Male	196	47	14.75 ± 7.93	
Female	224	53	11.51 ± 7.27	
Marital status				0.42
Single	340	80	13.10 ± 7.98	
Married	80	20	13.82 ± 6.94	
Living status				0.01
Home with family	247	59	14.02 ± 7.31	
Alone	100	24	12.95 ± 8.90	
In the dormitory	73	17	11.03 ± 7.40	

SD: Standard deviation

According to the CDAS score, 70.2% of the participants had no or mild anxiety, 25% had moderate anxiety, and 4.8% had severe anxiety. The prevalence of moderate to severe anxiety was 23% (45) and 36% (80) among men and women, respectively. Moreover, 29% of single and 32% of married interns were affected by moderate to severe anxiety. Moreover, anxiety was more prevalent (34%) among MIs who were living with their family (Table 2).

To determine the factors influencing anxiety level in MIs, student's t-test was conducted. The results showed that female interns were more likely to have anxiety during COVID-19 outbreak ($P < 0.01$). However, there was no significant difference between single and married groups ($P = 0.42$). One-way ANOVA revealed a correlation between living status and anxiety level ($P = 0.01$) (Table 1). To determine which subcategories were associated with anxiety, Tukey's post-hoc analysis was conducted and the results are presented in table 3. Anxiety due to the COVID-19 epidemic was significantly higher in MIs who were living with their family in comparison to those who lived in the dormitory. Living alone at home did not have a significant effect on the anxiety score of MIs.

Discussion

In this survey, our goal was to evaluate the psychological well-being of MIs during the COVID-19 pandemic and determine the factors that increased their anxiety level. Our results showed that 29.8% of interns were influenced by moderate to severe anxiety due to the COVID-19 outbreak which is more than the estimation of the study by Mattila, Peltokoski, Neva, Kaunonen, Helminen, and Parkkila (2020) who reported a 15% prevalence of moderate to severe anxiety in hospital staff. The main possible reason for this difference was a sudden growth in the number of suspected cases and deaths in Iran, so that there was at least 1 infected person in most families. The rapid rise in the number of cases forced the government to extend the quarantine. As of April 17th 2021, most of the businesses were closed and people were not allowed to move around the city after 10 p.m. Moreover, travelling outside the city was banned. These restrictions resulted in an increasing distance among people. Moreover, increased anxiety of MIs might have been related to the impact of the disease on their education, as presence of MIs at hospitals was reduced and their courses were taught online (Theoret & Ming, 2020).

Another study that was conducted in Iran at the beginning of the outbreak reported that 38% of medical students had experienced anxiety symptoms which is more than that in our study (Nakhostin-Ansari et al., 2020). The discrepancy might be due to the difference in the assessment stage and location.

Table 2. Prevalence of anxiety according to the demographic factors (n = 420)

Variable	Normal to mild anxiety [n (%)]	Moderate anxiety [n (%)]	Severe anxiety [n (%)]	P-value	Phi value
Gender				0.017	0.13
Male	151 (77)	38 (19)	7 (4)		
Female	144 (64)	67 (30)	13 (6)		
Marital status				0.65	0.05
Single	241 (71)	82 (24)	17 (5)		
Married	54 (67)	23 (29)	3 (4)		
Living status				< 0.01	0.20
Home with family	163 (66)	75 (30)	9 (4)		
Alone	74 (74)	16 (16)	10 (10)		
In the dormitory	58 (80)	14 (19)	1 (1)		

Table 3. The result of Tukey's post-hoc comparison for the living status items (n = 420)

Variable		Mean difference (I-J)	P-value
I	J		
Home with family	In the dormitory	2.98	0.01
	Alone	1.06	0.48
In the dormitory	Home with family	-2.98	0.01
	Alone	-1.92	0.24
Alone	Home with family	-1.06	0.47
	In the dormitory	1.92	0.24

By the time this survey was carried out, about 14 months after the onset of the outbreak, healthcare workers had become adjusted to the condition and were more able to manage the patients. In addition, healthcare authorities provided safer protective equipment in contrast with the early peak of the infection. The dissimilarity in the assessment tool could be another reason for the lower statistics in the current study compared to the mentioned study. To avoid the bias of measuring anxiety due to causes other than the outbreak, we used CDAS which is specifically designed to evaluate the anxiety caused by COVID-19.

A survey conducted on the Iranian general population reported a prevalence of 53.4% for anxiety which is higher than our statistics (Mohammadzadeh, Delshad, Khosravan, Bazeli, Armanmehr, & Paykani, 2020). This might be due to the better access of medical students to the most updated and reliable information resources about disease prevention and prognosis which results in reduced stress and anxiety (Saddik et al., 2020). Additionally, hospital personnel have a better opportunity to receive medical care and use greater therapeutic facilities in the condition that they become infected.

There were several limitations in the current investigation. The first limitation was the cross-sectional nature of the study and lack of a longitudinal follow-up. Second, as filling in the questionnaire was done voluntarily we might have selection bias. Third, we conducted the study in only one university, whereas educational and therapeutic strategies and patient load vary among different hospitals of universities. Therefore, more assessments in the medical universities of other regions of Iran are recommended. The final limitation was that there are other risk factors that were not evaluated in this study including age, level of knowledge about COVID-19, life-time psychiatric disorder, medical comorbidity, individual income, family social support, having children, smoking and alcohol consumption status, physical activity, and previous experience of COVID infection in the participants or their family members. Future studies can take these factors into consideration.

Our data also suggested that the anxiety level is higher in female interns. This finding is supported by other investigations among medical and non-medical individuals (Haque, Ul Islam, Hasan, Hossain, Hossain Khan, & Islam, 2022; Quintana-Domeque, Lee, Zhang, Proto, Battisti, & Ho, 2021). Nevertheless, neither Quek et al. (2019) nor Jafari, Nozari, Ahrari, and Bagheri (2017) have found a gender difference in anxiety level before the outbreak. This could be explained by the fact that differences in brain and bodily functions lead to different early and late responses to new conditions in men and women (Christiansen, 2015; Nakhostin-Ansari et al., 2020). It has been shown that living with parents, in contrast to living in the dormitory, was associated with increased anxiety in MIs. This variable had the most correlation with the development of anxiety in comparison to other stressors evaluated in this investigation (phi value = 0.20). Fear of being a carrier and the

possibility of transmitting the virus to other family members might be the reason for the higher anxiety in this group. However, living with parents was suggested as a protective factor in another study (Aylie, Mekonen, & Mekuria, 2020).

Conclusion

In summary, we estimated that 29.8% of MIs have experienced moderate to severe anxiety due to the COVID-19 pandemic. Female gender and living with parents were the independent factors associated with the development of anxiety. Due to the critical nature of MIs' role in patient care, it is suggested that medical universities and the government collaborate to provide an adequate psychological service for MIs, focusing on those who are in the high risk category.

Conflict of Interests

Authors have no conflict of interests.

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Statement of Ethics

This study was approved by the Ethics Committee of Shahid Beheshti University of Medical Sciences. All of the participants approved a written consent before starting filling the questionnaire.

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