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A Glimpse of Placebo and Nocebo Effects or Cain and Abel Story

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Editorial

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The placebo is the famous term in randomized placebo-controlled trials (RCT) and has an important role in any clinical setting and processes of evaluation, diagnosis, and intervention. Typically, placebo refers to the nonspecific effect of interventions, when they are beneficial and we try to maximize its effects when treating patients, but in RCTs, researchers would like to minimize the placebo effects to observe and estimate the real effect of interventions such as drugs or other kinds of treatments (Benedetti, 1996; Aslaksen & Lyby, 2015). The word "placebo" is derived from the Latin verb "placere" (pleasing) or "I shall please"; it is used to indicate sham treatments or inert substances such as sugar pills. The placebo effect is a psychological and/or physiological response that follows administration of inert substances or treatments (Flaten & Al'Absi, 2013). For example, an inactive medication administered together with information that it is an analgesic medication has been found to decrease pain and pain-related physiological reactions (Benedetti, 1996). On the other hand, the negative arm of placebo so called nocebo effect appears with unpredictable, adverse events and worsening of symptoms (Weimer, Enck, Dodd, & Colloca, 2020). The term nocebo (I shall harm) was introduced in contrast to "placebo" to discern the positive from the harmful effects of placebos, when an inert substance is given within a negative context, inducing negative expectations about the outcome. The nocebo effect is defined as increased pain or other symptoms after administration of an inactive treatment purported to increase pain or unpleasant symptoms (Vambheim & Flaten, 2017), or negative outcome following the application of an inert treatment that the recipient believes to be effective (Data-Franco & Berk, 2013).

Underpinnings of the placebo and nocebo

The underpinnings of placebo and nocebo as interesting phenomena are psychological and neurobiological. Psychological mechanisms include expectancies, different kinds of conditioning, learning models, memory, motivation, somatic focus,

reward, anxiety reduction, and meaning system (Chavarria et al., 2017; Nasiri-Dehsorkhi, Vaziri, Esmaillzadeh, & Adibi, 2023). Expectations not only play an important role in health consequences but also they are the main components of placebo and nocebo phenomena (Nasiri-Dehsorkhi, Vaziri, Esmaillzadeh, & Adibi, 2024). Because expectation facilitates the perception of a specific sensation and stimulus categories, this effect helps clarify why side effects often occur as a cluster of multiple symptoms. Patients do not always have fixed expectations from the treatment or any therapeutic situations; when a patient has negative expectations of his/her treatment consequences, it can reduce the effectiveness of the intervention or even cause side effects or adverse results. In such a situation, the term nocebo effect is used (Nasiri-Dehsorkhi et al., 2024). Actually, the placebo and nocebo responses are mediated by expectations, associative and social observational learning processes, patient's temperament and personality, societal factors, and the quality of the patient-physician interaction (Schedlowski, Enck, Rief, & Bingel, 2015). Research findings indicated that several factors were identified as main source of the nocebo effect. These include negative expectations, misattribution of symptoms, pervious learning, contextual components, social environment, verbal and non-verbal behaviors, observational learning, and the features of the treatment have also been proposed as important mechanisms. In figure 1, we can see the interactive factors that could provide placebo and nocebo responses (Petrie & Rief, 2019; Daniali & Flaten, 2019). The past three decades literature has shown advances in the understanding of neurobiological and neuropsychological mechanisms of these twin brothers, placebo and nocebo responses, in various medical conditions (Schedlowski et al., 2015).

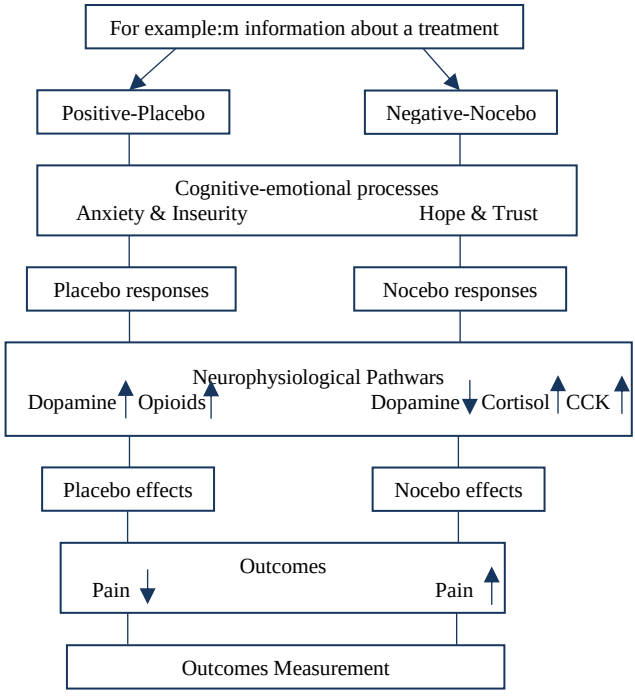

Figure 1. Descriptive map of psychological and neurobiological aspects of placebo and nocebo

For example, the frequency of the articles about placebo and nocebo effects in recent years is the best indication for this claim (Nasiri-Dehsorkhi, Vaziri, Esmaillzadeh, & Adibi-Sedeh, 2022).

Research findings have demonstrated that a number of neural networks are engaged in the placebo effect. These include the opioid, endocannabinoid, cholecystokinin (CCK), and dopamine systems. Recent functional imaging findings have shown changes in the brain related to the placebo effect. These brain areas include the anterior cingulate cortex, thalamus, posterior insula, and the cortex of somatosensory areas. These findings indicated that the placebo effect had true neurobiological mechanisms, but we do not know its triggers yet.

Findings about the neurobiology of placebo analgesia confirm that healthy brain activity is the base of placebo responses. However, people with highly functioning brains are able to develop robust placebo responses. Individuals with serious brain dysfunctions show no or reduced placebo response. Therefore, not surprisingly, placebo mechanisms are based on healthy brain connectivity, as has been confirmed by recent studies (Petrie & Rief, 2019).

Some psychological components are well known to contribute to the placebo effect. One of them is expectation theory, for example, if the expectation is high that a drug or treatment will be effective, a patient is more likely to experience a placebo effect. Besides, interpersonal interaction, specifically in clinical settings, is another important element in this regard (Lembo, 2020). On the other hand, cultural aspects also play a role in the illness representation, and apply their role through emotional and cognitive aspects (Reichardt, et al., 2018).

Crucial role of positive expectations in placebo responses could improve our understanding of the neurobiology of expectations and could represent the important relation between the clinical psychology and neurobiology of placebo mechanisms. From the neurobiological aspect, dopaminergic system and the nucleus accumbens are both significantly engaged in the processing of reward and it has led to the formulation of the placebo-reward hypothesis: Expecting a positive treatment effect followed by structures of reward processing system (De la Fuente-Fernandez, Ruth, Sossi, Schulzer, Calne, & Stoessl, 2001). In contrast to the placebo response, neurophysiological correlates of the nocebo response seem to involve more with negative expectations and anxiety pathways. For example, studies on nocebo hyperalgesia indicated hyperactivity of the hypothalamic-pituitary-adrenal (HPA) axis and CCK, a peptide hormone of the gastrointestinal (GI) system that is involved in anxiety symptoms (Petrie & Rief, 2019; Benedetti, Lanotte, Lopiano, & Colloca, 2007).

Genes perspective to the placebo and nocebo responses

Recent studies on genomics have presented a detailed examination of pharmacogenetic effects on active or inert interventions. The main question of these studies was that "why some people respond to a placebo and others do not?". Multiple genes associated with the placebo response are related to neurotransmitter pathways. One such gene is catechol-O-methyltransferase (COMT), which encodes an enzyme that metabolizes catecholamines like dopamine and epinephrine. Research has shown that polymorphisms in this gene are related to a stronger placebo response (Hall et al., 2016). Interestingly, the same gene seems to be involved in the development of nocebo responses, as well (Petrie & Rief, 2019).

Diversity of the nocebo responses

The high rates of nocebo effects are related to medical treatments and can cause significant issues in adherence and persistence with medical therapy and decrease the

quality of life for many patients, and its consequence is increasing of medical cost (Kardas, Lewek, & Matyjaszczyk, 2013). Complaint of drug side effects is the main focus of literature in nocebo studies; over time, the use of the term nocebo has widened. The term nocebo is now used to refer to the adverse effects of active treatments that cannot be attributed to the pharmacological or other active ingredients of the therapy (Barsky, Saintfort, Rogers, & Borus, 2002). Nowadays, the term nocebo has been extended to describe reported adverse effects following exposure to benign new technology, environmental agents, or stimuli that the individual believes are likely to cause symptoms or have other negative health effects (Rief, Glaesmer, Baehr, Broadbent, Brahler, & Petrie, 2012). For example, electro-sensitivity is one of those conditions, complaining of symptoms after being exposed to weak electromagnetic fields, such as Wi-Fi or cell phone signals, even though double-blind studies do not support a link between such exposure and symptoms or physiological effects (Rubin, Hillert, Nieto-Hernandez, van Rongen, & Oftedal, 2011). A popular illustration of the nocebo effect is the gluten-free diets. Many individuals now believe that they are gluten sensitive and report symptoms such as abdominal discomfort and bloating, as well as headache, lethargy, and other symptoms, following ingestion of products containing gluten. The gluten-free food manufacturing industry has grown rapidly to accommodate the popularity of this new diet, but double-blind provocation trials with either placebo or gluten have failed to support this sensitivity in individuals without celiac disease; a more likely explanation for the reported symptoms is the anticipation of intolerance and a misattribution of normal symptoms (Lionetti et al., 2017).

As mentioned in the beginning of the article, the placebo effect plays a valuable role in making any treatment more effective, while nocebo effects not only can neutralize the treatment but also impose unwanted side effects on the patient. In RCTs, the researcher seeks to control the placebo and nocebo effects with precise methods, and this actually shows the perfection of that research. By defining these two incongruous brothers, the present article aims to encourage the research interest of those interested in the field of placebo and nocebo effects to conduct more studies in this regard and to take their mentality beyond the field of therapeutic interventions. On the other hand, knowing the effects of placebo tells us that we are capable of repairing and correcting ourselves, and we could be very careful with our words, writings, and thoughts after the word "I am…". We should remember that, our negative thoughts significantly impact our health and performance through nocebo response process. Some systematic studies indicated that characteristics and nonverbal behaviors of providers like experimenters/clinicians contribute to the elicitation and modulation of pain, placebo, and nocebo effects. Therefore, our knowledge about placebo and nocebo effects says that when we believe that something affects our health positively or negatively, our mindset is a critical factor in our overall health.

Conflict of Interests

Authors have no conflict of interests.

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Psychological Analysis of the Impact of Social Media on Interpersonal Relationships: A Comparative Study

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Quantitative Study

Abstract

Background: This study explores the impact of social media on interpersonal relationships, focusing on the Chinese context. It investigates how social media platforms like Facebook, Instagram, and Twitter influence human interactions, societal behaviors, and psychological mechanisms, with particular emphasis on social comparison.
Methods: Employing a mixed-methods approach, the study combined quantitative and qualitative analyses. Participants were active social media users of 18-50 years of age from China. Data collection involved surveys, the Fear of Missing Out Scale, and content analysis of social media interactions, followed by statistical analysis using SPSS.
Results: A significant positive correlation (64.2 ± 3.1) was found between pro-environmental behavior and various forms of interpersonal communication, including both face-to-face interactions and those mediated by digital platforms. Gender differences were notable in social media engagement, especially among female users. Social media campaigns during the COVID-19 crisis showed considerable effectiveness in health communication (73.2 ± 5.4). Additionally, economic factors, particularly in low- and middle-income areas, significantly influenced the efficacy of social and behavioral change communication, underlining the importance of cost considerations in these strategies.
Conclusion: The study reveals the complex interplay of social media and interpersonal communication in China, highlighting the role of gender dynamics and economic factors. It offers valuable insights for policymakers and communicators, emphasizing the need for tailored strategies considering these diverse factors in the digital age. The findings suggest leveraging interpersonal channels for environmental advocacy and utilizing social media strategically in health communication and crisis management.
Keywords: Social media; Personal communication; Mental health; Self esteem

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Introduction

In the modern age, where digital technology and social media have become ubiquitous, understanding the interplay between these platforms and interpersonal communication is more crucial than ever. This study embarks on a detailed exploration of this dynamic, with a specific focus on the context of China. It aims to unravel the complexities of social media's impact on human interactions, societal behaviors, and psychological mechanisms, drawing upon a diverse range of scholarly works and empirical studies.

At the heart of this exploration lies the concept of social comparison, a psychological phenomenon that has gained new dimensions in the era of social media. Originating from Festinger's (1954) theory, social comparison involves the innate drive of individuals to evaluate themselves in relation to others. In the context of platforms like Facebook and Instagram, this drive takes on a new form, providing endless opportunities for individuals to compare their lives, achievements, and appearances with a wide network of peers and strangers (Xu, Yao, & Teo, 2020; Torous et al., 2021; Castillo-Abdul, Bonilla-del-Rio, & Nunez-Barriopedro, 2021). This study delves into how social media has modernized social comparison, while the underlying psychological mechanisms remain deeply rooted in our inherent desire to evaluate and define ourselves in social contexts.

The literature review section of the study is an extensive examination of various research areas, each contributing to a holistic understanding of the subject matter:

1. *Interpersonal Communication*: This aspect focuses on the critical role of interpersonal communication in shaping behaviors and attitudes in domains such as environmental awareness, family dynamics, and health protection measures. Key studies by researchers like Han and Xu (2020), and Lopez and Cuarteros (2020) are discussed, shedding light on how interpersonal communication, both in traditional and digital formats, influences individual and collective behavior.
2. *Traditional vs. Social Media:* The study contrasts the influences of social media and traditional media, investigating their distinct impacts on interpersonal relationships and societal trends. Researches by Tang and Chan (2021) and Han and Cheng (2020) provide insights into the varying effects of these media forms, highlighting the nuanced ways in which they shape public opinion and personal relationships.
3. *Health Communication and Crisis Management:* The role of social media in health communication, particularly during public health crises like the COVID-19 pandemic, is another focus area. The works of Duong, Nguyen, Julian, Nguyen, and Nguyen (2023) and Friemel and Geber (2023) illustrate the critical role played by digital platforms in disseminating health information and managing crises, underscoring the importance of strategies for clear communication during public health crises.
4. *Economic Dimensions:* The study also examines the economic aspects of communication strategies, especially in the context of low- and middle-income countries. The research by Bollinger, Bellows, and Linder (2023) forms the basis for understanding how economic factors influence the effectiveness of social and behavior change communication initiatives.

Building upon the literature review, the study presents a series of hypotheses, each addressing a specific aspect of the broader research question:

1. *Hypothesis 1 - Interpersonal Communication vs. Social Media:* This hypothesis posits that in China, personal conversations and interactions often play a more significant role in shaping environmentally conscious behaviors than

the effects of social media platforms. This claim is grounded in findings from studies such as those conducted by Han and Xu (2020), which highlight the effectiveness of direct human interaction over digital platforms in influencing environmental actions and attitudes.

2. *Hypothesis 2 - Gender Dynamics in Communication:* This hypothesis suggests that gender plays a significant moderating role in the relationship between social media use and interpersonal communication among Chinese students. The research by Widiyawati and Wulandari (2021), among others, provides evidence for this claim, demonstrating the varied ways in which gender influences communication patterns both online and offline.
3. *Hypothesis 3 - The Role of Social Media in Health Communication:* This hypothesis underscores the vital role of social media campaigns in health communication and crisis management in China, with a particular emphasis on the COVID-19 pandemic. Studies by Melki, Tamim, Hadid, Makki, El, and Hitti (2021) and Duong et al. (2023) highlight the influential role of social media in shaping public health narratives and responses during such crises.
4. *Hypothesis 4 - Economic Factors in Communication:* This hypothesis focuses on the impact of economic factors, including intervention costs, on the efficacy of social and behavioral change communication in low- and middle-income areas. The research by Bollinger et al. (2023) sheds light on how economic constraints and opportunities affect communication strategies.

Combining quantitative and qualitative analyses, this study adopted a mixed-methods approach to investigate the proposed hypotheses. This methodology allows for a comprehensive examination of the research questions, enabling a nuanced understanding of the complex interrelations between social media, interpersonal communication, and the various socio-cultural and economic factors at play.

The results of this research carry considerable consequences for those in policy-making, education, and communication roles. By providing a deeper understanding of the dynamics between social media and interpersonal communication, this research offers insights into how these platforms can be leveraged for positive societal change. This is particularly relevant in areas such as environmental advocacy, health communication, and family dynamics, where effective communication is key to achieving desired outcomes (Waisbord, 2018). Additionally, the economic considerations highlighted in the study point to the need for cost-effective and culturally sensitive communication strategies, especially in resource-constrained settings.

In conclusion, this study contributes significantly to the ongoing discourse on digital communication, offering valuable insights for adapting to the ever-evolving landscape of media and technology. It provides a nuanced understanding of how digital platforms influence human interactions and societal trends, thus paving the way for future research and interventions in this vital field.

Methods

Integrating both qualitative and quantitative research, this study employed a mixed-methods approach to investigate the multifaceted impact of social media on interpersonal communication, user-generated content (UGC), social norms, social comparison, the digital age, and human interaction.

The study focuses on individuals aged 18-50 years who are active social media users, engaging on platforms like Facebook, Instagram, and Twitter for at least one hour daily. This demographic is selected to represent a broad spectrum of adult social media users.

Inclusion Criteria: Participants had to be active users of at least one major social media platform for a minimum of one year.

Exclusion Criteria: Individuals below 18 years, non-social media users, and those using social media solely for professional purposes were excluded from the study.

Stratified random sampling was used to ensure representation across different ages, genders, and occupations. Additionally, snowball sampling was employed for qualitative interviews, particularly for hard-to-reach participants (Firew et al., 2020). The Fear of Missing Out Scale (FoMO) was integrated to measure the anxiety and apprehension associated with being absent from rewarding experiences that others might be having, a phenomenon often heightened by social media usage (Riordan, Cody, Flett, Conner, Hunter, & Scarf, 2020). The survey targeted a calculated sample size based on a 95% confidence interval (CI) and a 5% margin of error, with the formula: $n = (Z^2 * p * (1-p)) / E^2$, where Z is 1.96 for a 95% CI, p is the estimated population proportion, and E is the margin of error (Dong, Li, Zhang, Liu, & Cui, 2023).

Data collection was varied and comprehensive. For quantitative data, surveys and the aforementioned FoMO scale were the primary tools. Qualitatively, the study relied on the content analysis of social media interactions (like posts, comments, likes, and shares) and in-person methods like interviews and focus groups. These increased our understanding of the nuances of user-generated content and social norms as they manifest on digital platforms.

Regarding data analysis, the study utilized SPSS software (version 26; IBM Corp., Armonk, NY, USA) for its statistical analysis. This choice is driven by the software's robust capabilities in handling complex data sets and its user-friendly interface. The analysis included methods such as Pearson's correlation coefficient and regression models to explore and elucidate the relationships between various study variables.

Results

The following table presents the demographic breakdown of the study participants, who are active users of social media platforms such as Facebook, Instagram, and Twitter, within the age range of 18-50 years. This diverse sample was primarily based in China, offering insights into the comparative analysis of social media's impact on interpersonal relationships (Table 1).

This section provides an analysis of the data collected to investigate the four hypotheses related to interpersonal communication, social media, gender, economic factors, and health communication in China. Pearson's correlation was used to analyze the relationship between interpersonal communication and pro-environmental behavior.

Table 1. Demographic information of the sample

Demographic category	n (%)	Demographic category	n (%)
Age distribution (year)		Occupational background	
18-24	110 (19.54)	Students	100(17.76)
25-34	170 (30.20)	Professionals	200 (35.53)
35-44	140 (24.87)	Business owners	80 (14.21)
45-50	143 (25.40)	Others (incl. retirees, homemakers)	183 (32.50)
Gender distribution		Educational level	
Female	280 (49.73)	High School	113 (20.07)
Male	283 (50.27)	Bachelor's Degree	250 (44.40)
Geographical location		Master's Degree or Higher	200 (35.53)
Urban	350 (62.16)		
Rural	213 (37.84)		

This positive correlation indicates that interpersonal communication has a substantial effect on pro-environmental behavior in China (Table 2).

To test the moderation effect of gender on the relationship between social media use and interpersonal communication, a linear regression analysis was conducted. The results indicate that gender significantly moderates the relationship, with a higher correlation among female students.

The analysis of variance (ANOVA) was applied to compare the effectiveness of different social media campaigns during the COVID-19 crisis (Table 3).

The results show significant differences between the campaigns, supporting the importance of social media in health communication.

A regression analysis was performed to understand how economic factors affect the efficacy of social and behavioral change communication. The results reveal that intervention costs significantly impact the effectiveness, particularly in low- and middle-income areas of China.

The findings of this study confirm the importance of interpersonal communication, the moderating role of gender in social media use, the vital impact of social media campaigns on health communication, and the significant influence of economic factors on behavior change in China.

These results provide meaningful insights for policymakers, health communicators, and environmental advocates in China to strategize their approaches, considering the diverse factors affecting social behaviors and communication in the digital age.

In addition to the quantitative analysis presented earlier, our study also delved into qualitative research to gain a deeper understanding of the intricate dynamics of social media's impact on interpersonal relationships in China. Through a series of interviews and focus groups, we were able to capture the nuanced perspectives and personal experiences of our participants. This qualitative approach allowed us to explore the subtleties and complexities of social media usage that numbers alone cannot fully convey. The narratives and themes that emerged from these discussions provide invaluable insights into the diverse ways in which different demographic groups perceive and engage with social media, enriching our overall analysis. Below, we present the key qualitative findings that complement and deepen our understanding of the quantitative data.

Exploring the Dual Role of Social Media in Communication: Our interviews revealed mixed feelings about the impact of social media on communication. A recurring theme was the tension between convenience and the perceived superficiality of digital interactions. For instance, a 28-year-old professional from Beijing stated: "Social media bridges distances, but sometimes it feels like we are losing the essence of personal interaction." This sentiment was echoed in our focus groups, where we observed a generational divide; younger participants (18-25 years) were more inclined to praise the ease and reach of social media, whereas older participants (36-50 years) lamented a loss of depth in communication.

Gender Differences in Social Media Usage: The qualitative data also shed light on gender-specific patterns in social media use.

Table 2. Descriptive statistics for pro-environmental behavior and interpersonal communication

Variable	Mean	Median	Mode	Variance	SD
Interpersonal communication	64.2	64.0	60	9.4	3.1
Pro-environmental behavior	58.5	58.0	55	8.7	2.9

SD: Standard deviation

Table 3. Comparison of social media campaigns in health communication

Campaign type	Mean effectiveness	SD
COVID awareness	73.2	5.4
Vaccination	69.8	6.2
General health	65.1	5.9

SD: Standard deviation

Many female participants reported using these platforms primarily for personal and emotional connections, in contrast to male participants who often viewed social media as a tool for information gathering and professional networking. A 35-year-old male from Shanghai described his use of social media as "more oriented towards work-related networking and staying updated with news, rather than for personal conversations." These observations were further substantiated in our focus groups, highlighting a distinct divide in content sharing and engagement between male and female users.

Influence of Economic Factors on Online Interactions: Economic background emerged as a significant determinant of social media use. Participants from varied economic backgrounds displayed different patterns of use, influenced by factors such as internet accessibility and income. A poignant example came from a student in a rural area who said: "My access to and use of social media is limited by our internet connectivity." This contrasted with urban participants who exhibited more diverse and frequent use of social media. Such economic disparities were evident in the focus group discussions, emphasizing the role of socioeconomic status in shaping online behavior.

The Role of Social Media in Health Communication: Another striking theme was the role of social media in health communication, particularly highlighted during the COVID-19 pandemic. Participants recognized these platforms as crucial for spreading awareness and information. A healthcare professional underscored this, noting: "During the early stages of the pandemic, social media played a key role in disseminating vital health information and countering misinformation." However, concerns about the spread of false information were also prevalent, as discussed in our focus groups.

These qualitative findings provide a nuanced perspective on the study's topic, complementing the quantitative data and highlighting the complex interplay of social, economic, and personal factors in the realm of interpersonal relationships and social media.

Discussion

Interpersonal Communication and Pro-Environmental Behavior: The relationship between interpersonal communication and pro-environmental behavior in China is significant. The findings of this study are in line with the work of Phua, Jin, and Kim (2020) on Instagram's influence on health and environmental perceptions, like veganism. Kandul, Lang, and Lanz (2020) further support this by demonstrating the power of social comparison in energy conservation. These findings suggest that interpersonal dynamics, especially as mediated by social media, play a crucial role in shaping pro-environmental attitudes. This is particularly salient in China's unique cultural context. The specific mechanisms through which interpersonal communication bolsters environmental consciousness warrant further investigation. The study suggests a need to explore how different media and communication strategies can effectively promote sustainable behaviors.

Gender and Social Media: Gender plays a pivotal role in social media interactions

and self-disclosure, as highlighted by Widiyawati and Wulandari (2021). This research supports the hypothesis that gender significantly moderates the relationship between social media use and interpersonal communication among Chinese students. The gendered dimensions of online communication necessitate acknowledgment and integration into effective communication strategies. This perspective sheds light on the nuances of online interactions, including content creation, sharing, and reception. It prompts further exploration into how gender influences engagement with pro-environmental content and the implications for targeted environmental messaging.

Social Media's Impact on Health Communication: Social media's role in health communication, particularly highlighted during the COVID-19 pandemic, has been substantial. Duong et al. (2023) found that social media campaigns significantly contributed to COVID-19 prevention efforts in Vietnam. This aligns with the study's findings on the effectiveness of social media in health communication and crisis management in China. Melki et al. (2021) have further elucidated the critical role of accurate information dissemination in health communication. These insights highlight the necessity for robust strategies to ensure credibility and effectiveness of health communication on social media platforms.

Economic Influences on Social and Behavioral Change Communication: Bollinger et al. (2023) have provided insights into the economic factors affecting communication efficacy, particularly in low- and middle-income countries, including parts of China. This is in line with the study's observations on the significant influence of socio-economic factors on communication strategy and impact. Considering the socio-economic context is paramount when designing and implementing targeted interventions, especially in diverse economic landscapes like China, where economic disparities can influence how environmental messages are received and acted upon.

Conclusion

The study presents significant findings on the impact of social media on interpersonal relationships in the Chinese context:

1. *Interpersonal Communication and Pro-Environmental Behavior:* Interpersonal communication has a substantial impact on pro-environmental behavior in China. This emphasizes the importance of face-to-face interactions in shaping environmental consciousness.
2. *Gender's Role in Social Media Use:* Gender significantly moderates the relationship between social media use and interpersonal communication among Chinese students, indicating nuanced differences in engagement across genders.
3. *Effectiveness of Social Media in Health Communication:* Social media played a crucial role in health communication and crisis management during the COVID-19 pandemic in China, underscoring its importance in disseminating health information.
4. *Economic Factors in Communication Efficacy:* Economic considerations, particularly in low- and middle-income areas of China, significantly influence the efficacy of social and behavioral change communication.

These findings offer valuable insights for policymakers, health communicators, environmental advocates, and researchers, stressing the need for strategies that consider diverse factors affecting social behaviors and communication in the digital age.

Limitations: The current study offers valuable insights into the interconnected roles of social media, traditional media, and interpersonal communication in various societal domains. However, there are notable limitations that need to be addressed. Geographical Focus: Most findings are based on a China-centric approach. While this

provides depth in understanding the Chinese context, it may limit the generalizability of the results to other cultural or socio-economic settings. Gender Dynamics: Though some references, such as Widiyawati and Wulandari (2021), have explored gender aspects, the study could benefit from a more nuanced investigation into how gender interacts with different communication forms. Methodological Constraints: The reliance on specific statistical methods like Pearson's Correlation and Linear Regression may not capture the complexity of some relationships. There may be nonlinear or more intricate interactions that these methods fail to elucidate. Limited Scope of Social Norms: The study on social norms, although informed by research like Glass et al. (2019), could be expanded to include a broader array of social behaviors and attitudes, beyond gender-based violence. Selection of Media Platforms: The focus on popular social media platforms might overlook the influence of emerging or niche online communities. The changing landscape of social media necessitates a wider lens. Economic Factors: While the study delves into some economic aspects, especially in low- and middle-income areas (Bollinger et al., 2023), a more comprehensive analysis of how economic disparities influence communication behaviors may be warranted.

Future studies: Considering these limitations, there are promising avenues for future research. Cross-Cultural Comparisons: Extending the research beyond China to include various cultural contexts would provide a more comprehensive understanding of the global dynamics of interpersonal communication and media influence. Deeper Exploration of Gender: Future studies could employ a more intersectional approach to gender, considering how it interacts with other identity markers like age, ethnicity, or socio-economic status in shaping communication behaviors. Advanced Analytical Techniques: Utilizing more advanced statistical methods or machine learning techniques could uncover complex relationships that traditional methods may miss. Broadening the Scope of Social Norms: Investigating how social norms influence various societal behaviors, not only gender-based violence, could enrich the understanding of social influences in the digital age.

Conflict of Interests

Authors have no conflict of interests.

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Strength-Based Flourishing Intervention to Promote Mental Health and Resilience in Infertile Women

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Quantitative Study

Abstract

Background: Psychological interventions may reduce fertility problems. There have been educational programs for infertile women based on various theoretical frameworks; however, the strength-based approach has not been evaluated so far. This study aims to investigate the effect of strength-based flourishing intervention on promoting mental health and resilience in infertile women.

Methods: The current research was quasi-experimental with a pretest-posttest control group design. The statistical population included all infertile women referred to Sara and Naveed infertility clinic in Tehran, Iran, from October 2022 to November 2022. In this study, 30 eligible patients were selected purposefully. Researchers randomly divided the participants into two groups: a family therapy counseling (n = 15 people) and a control group (n = 15 people). The experimental group was taught methods and techniques of strengths-based strategies for eight 90-minute sessions of strength-based training adopted by Saleebey, whereas the control group received no psychological training during this time. The experimental and control groups were asked to fill in a pre-test and post-test questionnaire about the scale of General Health Questionnaire (GHQ) and the Connor-Davidson Resilience Scale (CD-RISC). Data were compared using multivariate and univariate analysis of variance (ANOVA). All statistical analyses were performed in SPSS software.

Results: As indicated by the univariate results, there was a significant difference between the groups regarding mental health ($F = 24.36$, $P = 0.001$, $\eta^2 = 0.523$) and resilience ($F = 26.76$, $P = 0.001$, $\eta^2 = 0.578$). The results of the within-group comparison showed that mental health significantly decreased and resilience increased, and the between-group

comparison showed that mental health significantly decreased and resilience increased at the level of $P < 0.001$.

Conclusion: It can be concluded that using the strength approach increases infertile women's mental health and resilience. Therefore, strength-based therapy for infertile women is recommended to increase their mental health and resilience and improve their quality of life.

Keywords: Strengths; Mental health; Resilience; Infertility

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Introduction

Infertility is defined by the American Society for Reproductive Medicine as the inability to conceive after 12 months of regular, unprotected sexual contact (Practice Committee of the American Society for Reproductive Medicine, 2020). The number of people with infertility worldwide exceeds 186 million (Sun, Gong, Jiang, Zhang, Zhao, & Wu, 2019). As many as one out of seven couples in Western countries suffer from infertility issues. The rate may reach 30% in some regions, such as South Asia, some countries in sub-Saharan Africa, and the Middle East (Tse et al., 2016). The prevalence of infertility among couples of reproductive age in China is 25% (Zhou et al., 2018). A 2017 Global Burden of Disease, Injuries, and Risk Factors Study found that infertility was rising in both men and women (Sun et al., 2019). Patients who have never been pregnant are called primary infertility. Secondary infertility is defined as follows: one partner in a couple has had at least one successful conception in the past and is incapable of conceiving now. Prior research has indicated that environmental pollution, life pressure, food safety, increasing childbearing age, and lifestyle change increase the prevalence of infertility (Zhao, Huangfu, Li, Liu, & Tang, 2022).

Infertility could lead to emotional, social, sexual, and family relationship problems. Infertile couples frequently experience negative emotions like sadness, worry, remorse, and isolation. According to earlier research, infertile women experience more tension than men because they must undergo more intensive treatment (Tang et al., 2022). Infertility can cause various physical, mental, and social diseases such as depression, anxiety, stigma (social stigma), and social isolation that affect patients' fertility. All these things can significantly affect the quality of life of fertility patients (Santona et al., 2023). In general, infertility is a complex life crisis that is psychologically threatening and emotionally stressful. Perhaps this is why some researchers have compared the psychological consequences of infertility to public grief reactions (Hoegholt, Buus, Fernandes, Sui, Vuust, & Kringelbach, 2023). The most problematic emotional effect of infertility is the loss of control in life when infertility freezes out other essential aspects of life. This may be because in childhood and adolescence, social implications about the consequence of parenting are always propagated, particularly regarding women (Santona et al., 2023).

Other studies show a significant relationship between anxiety, depression, and resilience; in other words, higher resilience predicts lower anxiety and depression (Al Omari et al., 2023). Several other studies have found a correlation between resilience and poor mental health among people with stressful lives (Wang et al., 2023). Many aspects of a person's life are affected by infertility, including the way that he perceives stressful situations and how well he can tolerate negative experiences. The risk of mental illnesses such as depression and anxiety is higher for those under chronic pressure (Al Omari et al., 2023). Other studies have shown that resilience affects mental health (Al Omari et al., 2023; Ramazani, Mohammadi Shir Mahleh, Ranjbaripour, Ahamdi, & Peymani, 2022). Resilience is the active and constructive participation of a person in the environment, and is the ability of a person to establish biological-psychological balance in dangerous situations (Choi & Moon, 2023).

However, resilience is the ability to overcome threats and external strength factors, including educational and family support (Al Omari et al., 2023). Resilience strengthens adaptation, promotes recovery, protects mental health, and maintains integrated positive functioning over time in the aftermath of adversity (Yan, Chan, Chow, Zheng, & Sun, 2020). Some studies have shown that psychotherapeutic interventions improve mental health, reduce anxiety and depression, and increase

fertility (Rahimi, Hasanpour, Mirghafourvand, & Esmaeilpour, 2021). Researchers believe that psychological counselling is essential before and during in vitro fertilization (IVF) cycles, and couples seek psychological counselling when undergoing IVF (Mousavi & Hasanpoor-Azghady, 2019). According to the studies, to prevent the incidence and exacerbation of psychiatric disorders, researchers recommend counselling and psychotherapeutic interventions to help infertile couples (Rahimi et al., 2021).

According to strength-based perspectives, people with physical disabilities can make their lives more meaningful by leveraging their strengths (Emmett, 2022). They can also adapt healthily to living with a disability, physically and psychologically (Remmers, Zurn, Anoschin, Topolinski, & Zimmermann, 2023). Living with meaning involves going beyond the present moment and moving steadily toward achieving value and meaning in life in a planned manner (Rose, Womick, & King, 2023). Studies have shown that people who find meaning in life may better cope with challenges related to disability. For example, individuals with physical disabilities who make or find meaning tend to show less negative emotions and higher well-being than those who cannot find meaning (Remmers et al., 2023). Recently, some studies have shown that individuals with physical disabilities or chronic diseases who find meaning in life may better cope with negative emotions. For example, a study of individuals with multiple sclerosis (MS) reported that making meaning resulted in benefits, including higher life satisfaction and lower levels of anxiety and depression (Shoshani, Steinmetz, & Kanat-Maymon, 2016). A strengths-based approach can help people manage their health problems using their strengths, capacities, and resources. Infertile women can benefit from this new program by developing new skills and strengthening their conditions. Researchers conducted this study to evaluate how strength-based flourishing therapy could help infertile women increase their mental health and resilience.

Methods

The current research was quasi-experimental with a pretest-posttest control group design. The statistical population included all infertile women referred to Sara and Naveed infertility clinic in Tehran, Iran, from October 2022 to November 2022. Based on the result of the previous study with a mean difference of 8 and standard deviation (SD) of 2.40, power of 0.8, probability of type 1 error as 0.05, and attrition rate of 10%, a total of 30 samples were calculated (Remmers et al., 2023). Inclusion criteria included the diagnosis of infertility by a gynaecologist, the absence of another acute or chronic disease, having at least a middle school education, and consenting to participate in the study. Exclusion criteria included a history of psychiatric medications, receiving psychological treatment simultaneously, being absent for more than two sessions, and not doing the homework assigned in therapy sessions.

First, the researcher referred to Sara and Naveed infertility clinic in Tehran from October to November 2022. Informed consent was obtained from the eligible participants. In this study, 30 eligible patients were selected and invited to participate purposefully. Moreover, the assignment of individuals to experimental and control groups was done randomly. Each participant received an envelope containing a number and a randomly selected identifier to determine whether they were in the experimental (n = 15) or control (n = 15) group (Rose et al., 2023). After coordination with Sara and Naveed infertility center, the treatment goals and the working method were explained to the participants, and the time and place of the treatment sessions were

coordinated over the phone. Then, they were asked to fill out the Connor-Davidson Resilience Scale (CD-RISC) and the General Health Questionnaire (GHQ). To protect patient data privacy, researchers assured them their data would be kept confidential.

The GHQ: To evaluate the effect of the psychosocial intervention on well-being, the GHQ-28 was chosen as the primary outcome based on results from a comparable trial and because it was evaluated as an appropriate tool to capture emotional stress (Goldberg, 1972). The GHQ-28 requests participants to indicate how their health, in general, has been over the past few weeks, using behavioral items with a 4-point scale indicating the following frequencies of experience: "not at all", "no more than usual", "rather more than usual", and "much more than usual". The scoring system applied in this study was the same as the original scoring system, 4-point Likert scale. The minimum score for the 28 version is 0, and the maximum is 84. Higher GHQ-28 scores indicate higher levels of distress. Goldberg suggests that participants with total scores of 23 or below should be classified as non-psychiatric, while participants with scores > 24 may be classified as psychiatric, but this score is not an absolute cut-off.

In Iran, Palahang et al. (1996) and Yaghobi (2009) reported the reliability coefficients as 0.91 and 0.88 for anxiety and depression, respectively. The reliability of the questionnaire in this study using Cronbach's alpha was calculated at 0.89 (Palahang, Nasr, & Shahmohammadi, 1996; Yaghobi, 2009).

The CD-RISC: It is a self-report scale developed by Connor and Davidson in 2003. The scale is a 25-item instrument that measures resilience structure in a five-point Likert-type from zero to four, with zero being the minimum resilience score (Connor & Davidson, 2003). Therefore, the range of test scores is between 0 and 100. Higher scores indicate higher resilience of the subject. Haghranjbar et al. (2011) estimated the reliability of the Conner and Davison scale as 0.89, using Cronbach's alpha, and also its validity was satisfactory. The reliability of the questionnaire in this study using Cronbach's alpha was calculated at 0.88 (Haghranjbar, Kakavand, Borjali, & Bermas, 2011).

An educational program focused on strengths-based abilities was then administered to the experimental group in 8 sessions once a week lasting for 90 minutes. Table 1 shows the content of strength-based training adopted by Saleebey (2006). The control group did not receive psychological training during these two months.

Table 1. Contents of strengths-based protocol sessions

Sessions	Contents
1	By focusing on what works, what makes people feel good, and what people care about, a strengths-based approach can be developed. The talents, resources, abilities, capacities, and aspirations of everyone are independent of how easily they express themselves.
2	A client is the expert in her or his situation. She or he knows what is best for them. A practitioner has theoretical and technical knowledge that can assist others rather than hinder them in their actions.
3	The focus is on people and their environments, and interventions are designed to address both.
4	By focusing on individual strengths and abilities, people are able to develop.
5	It is difficult to predict human behavior because it is complex. Trauma does not necessarily lead to problems for people who have experienced it, even if it is serious.
6	Intervention is a shared responsibility between practitioners, families, and communities. The basis for intervention planning is a mutual process that uses the available resources. Practitioners must have the ability to discover the strengths of their clients and the environments in which they work.
7	Attempts are made to assess both the risks and strengths of individuals, families, groups, and communities.
8	Interventions are not focused on finding the causes of people's problems, nor are labels or stigmatizing terms used. The goal is to understand how people deal with their difficulties in the present.

Both groups received post-test evaluations following these sessions. Researchers answered participants' questions and alleviated any concerns they might have had throughout the procedure. After completion of the study, an educational technique based on strength was given to the control group as part of the research ethics.

In this study, descriptive and inferential statistics were used to analyze data. In descriptive statistics, the mean and SD and the analysis of covariance (ANCOVA) test (to control pre-test scores) were used for inferential statistics. Normal distribution was assessed using Kolmogorov-Smirnov (K-S) test. Multivariate analysis of variance (MANOVA) was used to assess the effect of an intervention on two dependent variables. Then, univariate ANCOVA was used to separately assess the effect of an intervention on dependent variables adjusted for baseline values. The variance homogeneity assumption was assessed using Levene's test. The multivariate equality of covariance matrices was evaluated using Box's M. All statistical analyses were performed in SPSS software (version 26, IBM Corporation, Armonk, NY, USA).

Results

Demographic data showed that study subjects were between the age range of 26 to 44. In the experimental group, 29% of participants were aged between 31 and 34, while 33% were aged between 28 and 31. Women made up 68% of the experimental group and 59% of the control group. Moreover, participants' educational degrees were from middle school to the bachelor's degree in the test group (36%), and in the control group, the associate degree had the highest frequency (40%). Results indicate that between the test and control groups, there was no significant difference in demographic variables ($P > 0.05$).

Table 2 shows that mental health scores in the experimental group (89.70 ± 7.43, 63.78 ± 7.43) compared to the control group (61.11 ± 7.24, 60.56 ± 6.43), respectively, decreased more in the post-test. Moreover, the experimental (69.20 ± 7.28, 85.20 ± 7.28) and control (68.46 ± 8.67, 69.70 ± 8.34) groups, respectively, showed increased resilience in the post-test.

According to the K-S test, mental health (K-S = 0.47, P = 0.33) and resilience (K-S = 0.34, P = 0.35), we met the assumption of normal distribution. The assumption of homogeneity of variances according to Levene's test for the variable of mental health ($F_{1,28} = 1.14$, $P = 0.11$) and resilience ($F_{1,28} = 0.94$, $P = 0.17$) was confirmed. The multivariate ANCOVA (MANCOVA) for the main effect of an intervention was significant (Wilks' lambda = 0.557, F = 65.24, $P < 0.001$). As a result, the univariate results were explored to find whether the significant multivariate result was applied to one or both dependent variables. As indicated by the univariate results, there was a significant difference between the groups regarding mental health ($F = 24.36$, $P = 0.001$, $\eta^2 = 0.523$) and resilience ($F = 26.76$, $P = 0.001$, $\eta^2 = 0.578$). The results of the within-group comparison showed that mental health significantly decreased and resilience increased, and the between-group comparison showed that mental health significantly decreased and resilience increased at the level of $P < 0.001$.

Table 2. Results of multivariate analysis of covariance (MANCOVA) on variables

Variable	Group	Pretest (mean ± SD)	Posttest (mean ± SD)
Mental health	Experimental	89.70 ± 7.43	63.78 ± 7.43
	Control	61.11 ± 7.24	60.56 ± 6.43
Resilience	Experimental	69.20 ± 7.28	85.20 ± 7.28
	Control	68.46 ± 8.67	69.70 ± 8.34

SD: Standard deviation

Table 3. Results of analysis of covariance (ANCOVA) in the multivariate ANCOVA (MANCOVA) context

Dependent variable	Source	SS	df	MS	F	P-value	Eta
Resilience	Group	2364.03	1	2364.03	24.36	0.001	0.52
Self-efficacy	Group	1719.45	1	1719.45	26.67	0.001	0.57

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

Discussion

The current study evaluated the effectiveness of strength-based flourishing therapy in promoting mental health and resilience in infertile women. The data analysis findings indicate that strength-based therapy improves mental health and resilience in infertile women. It is important to note that strengths-based approaches do not only focus on people's characteristics but also on their environment and a range of circumstances that shape their lives (Remmers et al., 2023). In this approach, emphasis is placed on the client's competencies and the available resources. Instead of labelling clients, practitioners should use their theoretical and technical expertise to empower and support them. According to this perspective, everyone can live a fulfilling and meaningful life according to their terms (Emmett, 2022). The first finding on the effectiveness of strength-based therapy in promoting the mental health of infertile women was consistent with Flink et al. (2015) study that showed positive psychotherapy improved the pain threshold and mental endurance of infertile women (Flink, Smeets, Bergboma, & Peters, 2015). In order to explain the present findings according to Ebrahimi and Esmaeili (2023), it can be said that positive interventions increase positive thoughts, emotions, and behaviors and satisfy basic needs like love and self-autonomy, attachment; while relationship increases happiness and psychological well-being and reduces depression (Ebrahimi & Esmaeili, 2023). Strength-based treatment, therefore, helps infertile women avoid depression and poor mental health by promoting expert self-care or interior richness (Chandler, Kalmakis, Chiodo, & Helling, 2020).

Through stimulating and inspiring ideas from strength-based counseling, this method aids infertile women's improvement of mental fortitude. Strength-based flourishing intervention helps to improve mental health by focusing on issues and promoting well-being in all critical areas of life. It is essential to remember that psychological intervention, which emphasizes a person's internal strengths and abilities, is to have serenity, comfort, compassion, and preparedness to deal with issues or hurdles to avoid their recurrence (Ebrahimi & Esmaeili, 2023). Based on this, infertile women can achieve higher mental health by taking advantage of deep relaxation treatment and adaptive preparation to deal with problems.

The next finding on the effectiveness of strength-based therapy was about resilience in infertile women, consistent with previous studies (Proyer, Gander, Wellenzohn, & Ruch, 2016; Shoshani et al., 2016). These researchers reported that strength-based therapy could improve psychological well-being and happiness by increasing coping strength. In order to explain the present findings, positive psychotherapy through the establishment and expansion of positive emotions shields against mental problems, and hence increases people's psychological well-being and happiness. This approach creates meaning in people's lives, reduces mental problems, and increases happiness and adaptive coping strength (Rose et al., 2023). Strength-based therapy with an emphasis on the experience of positive emotion often by offering better ability in using capabilities and adaptability in coping with life's

problems and challenges of family environment, improves adaptability, strength to cope with problems, and resilience in infertile women. The use of interventions in strength-based therapy increases individual and family psychological components, and by increasing positive emotions, positive challenges and meaning of life increase, too (Emmett, 2022).

Previous findings suggest that a high-impact power-based approach can be successfully implemented in clinical treatments by healthcare practitioners and psychologists (Tse et al., 2016). Accordingly, Yan et al. (2020) studied the mental health of individuals with chronic illnesses both before and after a certain treatment, focusing on their emotional and social well-being, fulfillment in life, mental joy, and overall well-being before and after the intervention, considering their psychological and social well-being, life satisfaction, psychological happiness, and ontological well-being (Yan et al., 2020). Eight studies, including 692 patients, were identified and critically evaluated in this review. The meta-analysis results for three comparable studies showed that the intervention based on personality strengths effectively improved the self-esteem of patients with chronic diseases, significantly increased their mental health and resilience, and reduced their depression. The intervention group significantly improved its well-being, while the control group showed no such improvement. Evidence indicates that a strength-based approach promotes health outcomes, including reduced hospitalization rates, improved occupational and educational performance, and improved intrapersonal feelings of self-efficacy and hope (Tse et al., 2016). McFarland and Fenton (2019) compared the mental capacity and resilience of parents with mental illness before and after the intervention by considering their psychological and social well-being, life satisfaction, psychological happiness, and ontological well-being. Their study showed that mental capacity and resilience increased in parents with mental illness after participating in a strength-based intervention (McFarland & Fenton, 2019).

This study has limitations such as the limited scope of the infertile women in Tehran, lack of methods for random sampling, and lack of follow-up; thus, for better generalization of the results at the research level, other studies should be carried out in other cities and areas with different cultures on other women with follow-up and random sampling to increase generalizations.

Conclusion

The results indicate a significant impact of strength-based therapy on mental health and resilience in infertile women. According to the findings of this study, at the functional level, it is recommended that health centers for infertile women, besides medical treatment, should improve the psychological components of these women through strength-based therapy.

Conflict of Interests

Authors have no conflict of interests.

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Relationships between Physicians' Communication Skills, the Psychological Symptoms of Cancer Patients, and their Satisfaction with the Treatment

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Quantitative Study

Abstract

Background: The communication skills of treating physicians can affect the psychological burden of cancer patients and the prevalence of mental illness among these patients. This study investigated the communication skills of physicians and their relationship to the psychological symptoms of cancer patients and their satisfaction with the treatment they received.

Methods: This cross-sectional descriptive study was carried out in 2019. A total of 160 cancer patients who fulfilled the inclusion criteria and referred to Omid Hospital in Isfahan, Iran, and the Iranian Cancer Control Center (MACSA) took part in the study. Demographic information, including age, sex, marital status, education, and type and stage of the disease, was collected using the Demographic Information Questionnaire. The patients' psychological states and satisfaction were then measured using the Patient's Depression, Anxiety, and Stress Scale (DASS), the Short Assessment of Patient Satisfaction (SAPS), and the Communication Assessment Tool (CAT). Correlation coefficients and multiple linear regression were performed using the SPSS software to analyze data.

Results: There was a significant direct relationship between the two quantitative variables of CAT and SAPS scores ($r = 0.752$; $P < 0.001$). There was also a significant relationship

between the depression (r = -0.318; P < 0.001) and stress (r = -0.303; P < 0.001) scores and the CAT score. The mean SAPS score in patients undergoing radiotherapy was significantly lower than in the stages of chemotherapy (beta (SE) = -3.14 (1.05); P = 0.003).

Conclusion: It was found that physicians' communication skills play an essential role in patients' satisfaction and are directly correlated. We also showed that the physician communication skills score was inversely related to patients' depression.

Keywords: Physician-patient communication; Patient satisfaction; Communication skills; Psycho-oncology; Anxiety; Stress

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Introduction

Cancer is recognized as one of the most critical problems in medicine today. With the increase in the average age of the population and increased life expectancy in different communities, the prevalence of various types of cancer has also increased (van der Meel, Sulheim, Shi, Kiessling, Mulder, & Lammers, 2019). Lifestyle changes, decreased activity, and changes in habits and diet are among the factors that have increased cancer rates in recent decades (Murphy et al., 2019). Cancer currently accounts for 12% of all deaths worldwide (Sitarz, Skierucha, Mielko, Offerhaus, Maciejewski, & Polkowski, 2018). Among the various treatments used today for treating cancers are chemotherapy, surgery, radiotherapy, and immunotherapy (Miller et al., 2019).

Studies have shown that cancer can have adverse effects on patients' psychological well-being and also has an impact on their quality of life (QOL) (Schneeweiss et al., 2018; Van Leeuwen et al., 2018). Many patients with cancer experience psychological and social issues, including fatigue, anxiety, difficulty sleeping, pain, anger, depression, loneliness, and stress; these may be due to severe complications and high mortality rates. The psychological problems of cancer patients significantly affect their QOL, suicidal thoughts, length of hospitalization, and even longevity (Wang et al., 2020). For cancer patients, as with other chronic diseases, maximization of QOL and the treatment of the patients are the primary goals of healthcare (Yang, 2019). Increasing QOL, accelerating recovery, and reducing the length of hospitalization will ultimately reduce hospital costs for these patients.

Effective patient care depends on the physicians' understanding of the patient's biological, psychosocial, and cultural status. Correct interpretation requires effective communication between the physician and the patient (Garrett, 2016). Regardless of a physician's academic knowledge, having practical communication skills can be a critical factor in following up on a patient's problems (Nelson, 2017). Some studies have suggested that successfully communicating with patients leads to better understanding, reduced patient stress, improved patient acceptance, decreased numbers of medical errors, improved disease course, and increased physician-patient satisfaction (Allenbaugh, Corbelli, Rack, Rubio, & Spagnoletti, 2019; Seiler et al., 2017).

Various studies have focused on the effects of the communication skills of physicians and their role in the treatment trends in patients (Levinson, Lesser, & Epstein, 2010). These studies have explained that adequate physician-patient communication and improving physicians' communication skills could result in increased patient satisfaction and decreased stress and psychological symptoms (Fallowfield, 2008; Sany, Behzhad, Ferns, & Peyman, 2020). However, there is still much to be learnt about differences in communication skills and styles in different cultures and countries (Hall, Keely, Dojeiji, Byszewski, & Marks, 2004). Very few studies have assessed communication in the context of Iranian healthcare. In 2012, a study was conducted in Iran that assessed the communication skills used by medical staff among themselves and declared that the communication between nurses and physicians was not satisfactory and could have adverse effects on the patients (Aghamolaei, Tavafian, Hasani, & Moeini, 2012). Another study found that communication among medical staff and between physicians and patients should be improved, and this issue could be helpful for the emotional progression of patients (Jasemi, Rahmani, Aghakhani, Hosseini, & Eghtedar, 2013).

Therefore, this study was conducted to determine whether there is a relationship between physicians' communication skills, the psychological symptoms of cancer patients, and their satisfaction with treatment

Methods

This cross-sectional study was conducted from September 2019 to February 2020 at Omid Hospital, affiliated with Isfahan University of Medical Sciences and the Iranian Cancer Control Center (MACSA). The study population was selected using a simple random sampling method from among cancer patients referred to these two centers over six months.

The criteria for inclusion in the study were a diagnosis of cancer by an expert oncologist, the patient either being in treatment or up to 6 months after completion of treatment, a willingness to participate in research, and a minimum education level of diploma. The exclusion criteria included having a chronic mental or personality disorder, being in the terminal stage, and a reluctance to participate in the study.

A total of 160 patients took part in the study, fulfilling the inclusion criteria. Demographic data, including age, gender, marital status, education level, type, and grade of the disease, were collected. The patients were then asked to fill out the Depression, Anxiety, and Stress Scale-21 (DASS-21), the Short Assessment of Patient Satisfaction (SAPS), and the Communication Assessment Tool (CAT).

DASS-21 (Lovibond et al.): DASS-21 has 21 questions with general, low, medium, and high scales. This questionnaire contains a set of 3 scales designed to measure negative emotional states of depression, anxiety, and stress. Each of the three scales has 14 items divided into 2 to 5-item subsets with similar content. The Depression Scale assesses depression, frustration, feelings of worthlessness, reluctance, loss of interest, lack of pleasure, and stillness. Anxiety scale include autonomic arousal, effects on muscles, situational anxiety, and the mental experience of anxiety. The Stress Scale is sensitive to levels of chronic nonspecific arousal. This scale includes problem relaxation, nervous arousal, whether patients are easily upset or disturbed, easily irritated or restless, and whether or not they are impatient. The total score of the questionnaire ranges from 21 to 84. Based on DASS-21, the severity of depression is classified into groups of normal (scores of 0-9), mild (10-13), moderate (14-20), severe (21-27), and very severe (+28). The severity of anxiety is classified into groups of normal (scores of 0-7), mild (8-9), moderate (10-14), severe (15-19), and very severe (+20). The stress of the patients is categorized into normal (scores of 0-14), mild (15-18), moderate (19-25), severe (26-33) and very severe (+34). This scale was developed by Lovibond et al., and it is a set of three self-report scales used to assess negative emotional states of anxiety, depression, and stress (Jun, Johnston, Kim, & O'Leary, 2018). This questionnaire's short, 21-question form has been validated in Persian with a Cronbach's alpha of 0.77, 0.79, and 0.78 for the depression, anxiety, and stress scales, respectively (Sahebi, Asghari, & Salari, 2005).

SAPS (Hawthorne et al.): SAPS is a concise, reliable, valid, seven-item scale that can assess patients' satisfaction with their treatment. The scale includes seven assessments of critical areas of patient satisfaction, including satisfaction with treatment, explanation of treatment outcomes, clinical care, participation in medical decision-making, respect for the physician, time with the physician, and satisfaction with hospital/clinic care. The items are scored on a 5-point Likert scale. Studies have shown that SAPS is a valid and reliable measure of patient satisfaction. Cronbach's alpha reliability ($\alpha = 0.85$) indicates a significant correlation with other criteria of patient satisfaction and treatment outcomes (Hawthorne, Sansoni, & Marosszeky, 2009).

CAT (Makoul et al.): The CAT questionnaire assesses the patient's perception of the quality of a physician's communication skills. This scale has 15 items that ask

respondents to rate the communication skill aspects on a five-point Likert scale (1 = poor, 2 = fair, 3 = good, 4 = very good, and 5 = excellent) (Ferranti, Makoul, Forth, Rauworth, Lee, & Williams, 2010). The acceptable Cronbach's alpha reliability (α = 0.96) indicates that CAT is an appropriate instrument for evaluating communication skills (Makoul, Krupat, & Chang, 2007).

The forward and back-translation method was used to ensure the validity of the SAPS and CAT questionnaire based on the World Health Organization (WHO) guidelines (World Health Organization, 2009).

Ethical considerations: All the participants have provided written informed consent. Patients were assured that their information would only be used for research purposes and would remain confidential. The current study followed the Declaration of Helsinki on Biomedical Research Involving Human Subjects and was approved by the Ethics Committee of Islamic Azad University, Isfahan (Khorasgan) Branch (IR.IAU.KHUISF.REC.1399.246). There was no interference concerning providing services to patients.

Statistical analysis: Data from the DASS-21, SAPS, and CAT scores were gathered from patients and analyzed using SPSS software (version 19; SPSS Inc., Chicago, IL, USA). Continuous variables were presented as mean [standard deviation (SD)] and categorical data as numbers (percentage). ANOVA was performed to compare the means of the CAT score according to the severity of depression, anxiety, and stress. The Pearson correlation coefficients were calculated for the correlation between CAT scores, SPAS, depression, anxiety, and stress scores. Multiple linear regression was used for the association between SPAS score and demographic and clinical variables. P-value < 0.05 was considered significant.

Results

A total of 160 patients with a mean age of 49.08 ± 13.94 years participated in the present study. The study population comprised 52 men (32.5%) and 108 women (67.5%). Primary analysis of demographic data showed that the mean duration of the disease was 1.59 ± 1.45 years. Moreover, 119 patients (47.4%) were married, and 41 (25.6%) were single. Data regarding marital status, educational level, occupation, type of cancer, and treatment method are summarized in table 1.

Table 1. Clinical and demographic characteristics of included patients

Variable		n (%) (total = 160)
Marital status	Married	119 (47.4)
	Single	41 (25.6)
Educational level	Lower than Bachelor's	141 (88.1)
	Higher than Bachelor's	19 (11.9)
Occupation	Employed	40 (25)
	Housewife	99 (61.9)
	Student	7 (4.4)
	Retired	13 (8.1)
	Unemployed	1 (0.6)
Type of cancer	Bone marrow	24 (15)
	Breast	71 (44.4)
	Head and neck	15 (9.4)
	Gastrointestinal	24 (15)
	Genitourinary	19 (11.9)
	Lung	7 (4.4)
	Chemotherapy	130 (81.8)
	Radiotherapy	20 (12.6)
	Recovering	9 (5.7)

Table 2. Descriptive statistics of SAPS, CAT, and DASS-21 questionnaires

		n	Min	Max	Mean ± SD
SAPS		160	3	29	21.85 ± 4.26
CAT		160	20	70	52.04 ± 9.87
DASS-21	Depression	160	7	28	11.86 ± 3.99
	Anxiety	160	7	21	10.92 ± 3.02
	Stress	160	7	28	14.41 ± 4.30

SD: Standard deviation

Table 2 presents the descriptive statistics of SAPS, CAT, and DASS-21 questionnaires. The mean (SD) SAPS score in patients was 21.85 (4.26), and the mean (SD) CAT score was 52.04 (9.87).

Table 3 presents the frequency (%) of patients and a comparison of mean CAT scores according to the severity of depression, anxiety, and stress in the patients. The mean CAT score was significantly low for the high severity of depression (P = 0.001), anxiety (P = 0.001), and stress (P < 0.001). The majority of patients had mild severity of depression (43.1%), moderate severity of anxiety (55.6%), and normal severity of stress (54.4%).

Table 4 shows the correlation between CAT and scores of depression, anxiety, stress, and SAPS. There were significant indirect correlations between CAT scores and depression, anxiety, and stress. However, there was a significant correlation between CAT and SAPS scores (r = 0.725; P < 0.001).

Table 5 shows the association of demographic and clinical variables with SAPS score. The mean SAPS score in patients being treated with radiotherapy was significantly lower than in chemotherapy (beta (SE) = -3.14 (1.05); P = 0.003). Moreover, the mean SAPS score in lung patients was significantly lower than in breast cancer (beta (SE) = -4.10 (1.89); P = 0.031). There was no significant association between other variables and SAPS score (P > 0.05).

Discussion

The present study aimed to survey the relationship between physicians' communication skills and the psychological symptoms of cancer patients and their level of satisfaction with the treatment. Our results have demonstrated that there was a direct relationship between physicians' communication skills and patients' satisfaction. In addition, the depression, anxiety, and stress levels that patients experienced were inversely related to the quality of the physician's communication skills. The patients' satisfaction during radiotherapy treatment was significantly lower than during chemotherapy.

Some similar studies have been carried out previously. In 2003, a survey by Shilling, Jenkins, and Fallowfield (2003) assessed various factors that affected patient satisfaction.

Table 3. The comparison of and mean CAT Scores according to the severity of depression, anxiety, and stress

Severity	Depression		Anxiety		Stress	
	n (%)	Mean ± SD	n (%)	Mean ± SD	n (%)	Mean ± SD
Normal	49(30.6)	54.31 ± 8.76	16(10)	56.06 ± 5.54	87(54.4)	54.07 ± 8.73
Mild	69(43.1)	52.88 ± 9.29	36(22.5)	53.47 ± 8.89	42(26.3)	52.88 ± 10.10
Moderate	37(23.1)	48.78 ± 11.33	89(55.6)	52.44 ± 9.96	29(18.1)	45.66 ± 10.08
Severe	3(1.9)	44.67 ± 7.23	16(10)	44.06 ± 9.78	2(1.3)	39.00 ± 4.24
Very severe	2(1.3)	39.00 ± 4.24	3(1.9)	44.33 ± 16.92	0(0)	0 ± 0
P	0.001		0.001		< 0.001	

SD: Standard deviation

Table 4. The correlation between CAT and scores of DASS-21 subscales and SAPS

		r	P
DASS-21	Depression	-0.318	< 0.001
	Anxiety	-0.185	0.019
	Stress	-0.303	< 0.001
SAPS		0.725	< 0.001

Their research emphasized the role of physicians' communication skills (Shilling, Jenkins, & Fallowfield, 2003). Eğeci and Gençöz (2006) also examined patient satisfaction in their study. The factors affecting patient satisfaction were analyzed, and it was found that the stage of the disease, treatment costs, recovery time, and the professional behavior of the medical staff were among the most critical factors. They also stated that physicians' communication skills are perhaps the most important factor, depending on the patient's beliefs and culture (Eğeci & Gençöz, 2006). Therefore, it has been found that in most societies, physicians' communication skills is one of the most critical factors in increasing patient satisfaction.

The role of communication skills has been explored not only among physicians, but also among other medical professionals such as nurses. Mullan and Kothe (2010) found that nurses' functional skills were as essential to patients as their communication skills. The findings of these studies are in line with the results of our research. However, no study has been carried out specifically to measure the importance of physicians' communication skills on the severity of patients' stress, anxiety, and depression, as well as their satisfaction.

Additionally, several studies emphasized the importance of medical team training for the improvement of communication skills. Goelz et al. (2011) showed that communication training for medical teams could be useful for shifting from palliative care to clinical practice and suggested that future studies explore this further.

Table 5. The association of demographic and clinical variables with SAPS score

Variables	Beta	SE	P
Age (year)	0.03	0.03	0.263
Duration	0.00	0.02	0.894
Gender (Ref. group: Male)			
Female	-1.30	1.35	0.338
Marital status (Ref. group: Married)			
Single	-0.25	0.84	0.769
Treatment method (Ref. group: Chemotherapy)			
Radiotherapy	-3.14	1.05	0.003
Recovering	1.70	1.61	0.293
Type of cancer (Ref. group: Brest cancer)			
Gastrointestinal	-1.34	1.04	0.202
Bone marrow	-1.11	1.25	0.376
Lung	-4.10	1.89	0.031
Genitourinary	1.71	1.14	0.136
Head and neck	0.73	1.35	0.588
Occupation (Ref. group: Housewife)			
Employed	-1.15	1.32	0.385
Retired	-0.56	1.81	0.756
Student	-0.11	2.05	0.956
Unemployed	7.99	4.91	0.106
Educational level (ref. group: Lower than Bachelor's)			
Higher than Bachelor's	-0.77	1.17	0.508

A study showed that communication training is very beneficial for providing information on clinical trials (Wuensch et al., 2017); and as another one declared, communication training could lead to some observable and significant changes in the communicative behavior of oncologists in clinical practice (Niglio de Figueiredo et al., 2018).

As previously mentioned, we have shown that there is a diverse relationship between the physician's communication skills and the patient's depression, anxiety, and stress levels. The patients who experienced higher levels of depression, anxiety, and stress rated the quality of their physician's communication skills significantly lower than patients with lower levels of depression, anxiety, and stress. We also found a direct relationship between physicians' communication skills and patients' satisfaction. In 2004, a study examined communication training programs for the improvement of communication behavior and reduction of job stress among physicians specializing in hematology (Delvaux, Razavi, Marchal, Brédart, Farvacques, & Slachmuylder, 2004). In addition to demonstrating the effectiveness of communication training, they stated that improving physicians' communication skills in dealing with cancer patients could reduce the patients' depression and anxiety (Delvaux, Razavi, Marchal, Brédart, Farvacques, & Slachmuylder, 2004). Razavi et al. (2003) evaluated the advantages of enhancing physicians' communication skills in cancer care. They trained and evaluated 63 physicians and showed that consolidation workshops improve a communication training program's efficacy and facilitate the transfer of acquired skills to clinical practice (Razavi et al., 2003). It has also been indicated that psychological training programs could improve healthcare professionals' sensitivity to communication problems with patients and relatives (Razavi & Delvaux, 1997). Another study suggested that educating students and physicians dealing with cancer patients and improving their communication skills improves patients' mental state and reduces their stress and anxiety (Bragard et al., 2006). Thirty-six psycho-oncology experts were asked to rate the necessity of defined educational needs in the field of psycho-oncology. Their results declared the priority and importance of all educational needs. They also suggested that the psycho-oncology curriculum in postgraduate education can be modified to improve cancer patients' QOL (Amani & Sharbafchi, 2020).

The link between physicians' communication skills and patients' depression was also investigated by Vogel, Leonhart, and Helmes (2009) in patients with breast cancer. In this study, 135 patients were evaluated. It was shown that patients' stress and depression are inversely related to physicians' communication skills. To explain the reason for this relationship, they stated that with improvements in physicians' communication skills, there is an increase in patients' feelings of intimacy and trust, which reduces stress and depression in patients (Vogel, Leonhart, & Helmes, 2009). Another research also found that patients' stress and depression were inversely related to physicians' communication skills (Ghods, Roter, Ford, Larson, Arbelaez, & Cooper, 2008). This study also showed that the rate of depression in patients decreases with the improvement of physicians' communication skills (Ghods et al., 2008). All these results are in line with our results about the relationship between physicians' communication skills and patient's depression, anxiety, and stress.

Our study found no significant relationship between patients' satisfaction level and age, sex, marital status, education, occupation, and duration of illness. The related factors were the type of cancer and treatment method. The patients who had

lung cancer and those who underwent radiotherapy rated their satisfaction with their treatment as lower than patients with breast cancer and those who underwent chemotherapy. Accordingly, among factors affecting patient satisfaction, the physician communication quality was the most important one that we can plan to improve. Two other studies have shown that the type of cancer and patient education can be essential factors in patient satisfaction and QOL; however, this relationship needs further study (Sharbafchi, Rajabi, Sheshboluki, Ghaderi, Fayazi, & Mousavi, 2019; Sitzia & Wood, 1997).

Patient satisfaction associated with what stage of treatment they are at is particularly important with cancer patients (Ong, Visser, Lammes, & De Haes, 2000). We believe this could be mostly due to the complications of radiotherapy and patients' prejudgments about this method. Other reports also addressed this issue (Cordeiro, Albornoz, McCormick, Hu, & Van Zee, 2014; Poinsot et al., 2006). Mucositis, dermal burns, and gastroenteritis are the most prevalent complications of radiotherapy, which can significantly influence a patient's satisfaction (Lee et al., 2010). Additionally, higher satisfaction levels in the recovery stage could also be due to the patients' increased feelings of hope and a reduction in the number of complications compared to other stages.

Clinical Implications: Our key contribution to the field is that we have assessed physicians' communication skills and patients' satisfaction scores and their relationships to different factors that have not been studied previously. We suggest that communication skills be deeply integrated into educational programs for medical students and physicians on the way to specialization.

Limitations: The limitation of our study was the non-humogen distribution of cancer types and treatment methods, which may influence the patients' mood states and satisfaction. To achieve more conclusive results, we suggest that future studies be conducted in a population including relatively equal sample sizes for each cancer and treatment stage.

Conclusion

To summarize, we have shown that physicians' communication skills play an important role in patients' satisfaction and are directly correlated. We have also demonstrated that the physician communication skills score was inversely related to patients' depression. These findings are in accordance with most previous studies, although until now, there have been very few studies in this regard.

Conflict of Interests

Authors have no conflict of interests.

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The study protocol was confirmed by the Ethics Committee of Islamic Azad University, Isfahan (Khorasgan) Branch.

Freely given, informed consent to participate in the study was obtained from participants. The informed consents were confirmed by the Ethics Committee of Islamic Azad University, Isfahan (Khorasgan) Branch.

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The Effectiveness of Positive Intervention on Spiritual Well-Being of Older People in Nursing Homes

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Quantitative Study

Abstract

Background: Spiritual care included in the holistic care model has become highly important with the increase in health and disease needs of the individuals. The aim of this study was to evaluate the effectiveness of positive intervention on spiritual well-being (SWB) of older people in nursing homes.

Methods: The current research was semi-experimental with pretest-posttest design with a control group. The statistical population of the present study was made up of the nurses of the nursing home of Shahrekord City, Iran, in 2016. From this statistical population, 40 people were selected by purposive sampling method and assigned to two experimental (n = 20) and control (n = 20) groups by the random sampling method. The intervention treatment protocol based on Rashid positive psychology was used to conduct the research. Spiritual Well-Being Scale (SWBS) was used to collect information. The data were analyzed using analysis of covariance (ANCOVA) by SPSS software.

Results: Positive intervention had a positive and significant effect on SWB (F = 17.25, P = 0.001). Consequently, there was a meaningful difference between the mean scores of the two groups in the post-test.

Conclusion: The results of the research indicated that the training and implementation of the treatment protocol increased SWB. As a result, positive intervention has a positive and significant effect on SWB. In other words, by participating in these meetings and getting familiar with the concept of positive intervention, nurses will get to know their personality traits, and their internal control and SWB will increase.

Keywords: Positive therapy; Spiritual well-being; Older; Nursing homes

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Introduction

Aging is one of the most prevalent demographic changes in the current century. Along with the development of economic and social conditions of societies and the appearance of new technologies in the field of diagnosis, prevention, and treatment of diseases, primary health care, and also the expansion of family planning programs, the world's elderly population has increased (Rashedi & Bahrami, 2015). Based on various sources, it is predicted that the number of elderly people (people over 65 years old) in the world, which was 600 million people in 2003, will almost double in 2025 and will increase to over 2 billion people in 2050. Statistics show that the growing trend of the older adult population is higher in developing countries, and currently, 59% of the world's elderly population lives in these countries, and this number will increase to 70% by 2030 (Bloom, Canning, & Lubet, 2015).

Some observe through statistics that Iran is also experiencing this phenomenon, where it is estimated that by 2050, a significant proportion of the country's population will be elderly. This statistical evidence also suggests that the demand for nursing homes and caretakers for older adults will rise in response to this trend. The golden years mark a crucial stage in life where individuals are exposed to various risks related to their physical and mental well-being, including enduring chronic ailments, social isolation, and inadequate social networks. The level of support provided to old members by their families is decreasing. The rise in the generation and age divide between the youth and older adults, coupled with a decrease in the number of kids and an increase in the life span of older adults, is the main factor behind this problem. This causes more elderly care in their sunset years (Jadidi, Sadeghian, Khodaveisi, & Fallahi-Khoshknab, 2022).

As of late, because of the growth in the number of older individuals, it is expected that a considerable amount of elderly will require extended care. There is a scarcity expected in the nursing profession. Nurses in nursing homes are often confronted with extended working hours, excessive workloads, challenging situations, and a wide range of geriatric health issues, which can make caring for older adults a daunting task. The strain experienced by nursing staff can have adverse health outcomes, which are linked to decreased wellness and lower quality of care provided to older individuals (Salvagioni, Melanda, Mesas, Gonzalez, Gabani, & Andrade, 2017). Enhancing the mental well-being of nursing staff is crucial to ensure the stability of the workforce in care facilities (Collet, de Vugt, Schols, Engelen, Winkens, & Verhey, 2018). According to Ellison's perspective (1983), the concept of spiritual well-being (SWB) integrates both religious and psychosocial factors. Those who believe that spirituality plays a significant role in fostering good relationships and mental well-being have attempted to link spirituality and health regarding SWB. According to Ellison, SWB encompasses aspects connected to one's religious beliefs, social connections, and psychological state (Ellison, 1983). Being spiritually sound involves having a relationship with a superior force, such as the divine entity known as God. One of the socio-psychological components is existential well-being (EWB), which reflects an individual's sentiments about their identity, actions, motivations, and place within society. Despite being distinct, these dimensions have an interconnected and interdependent relationship with each other. As a result, a sense of contentment, direction, and emotional well-being will ensue (Sahan & Yildiz, 2022).

Traditionally, the emphasis in psychology has been predominantly on diminishing issues related to mental wellness. Presently, mental health treatments aimed at nursing staff primarily concentrate on managing stress and lessening

burnout (Romppanen & Haggman-Laitila, 2017). It is becoming more common to acknowledge that optimal functionality does not rely on an individual's absence of mental health issues. In recent times, an emerging field of study that centers on spiritual wellness has gained traction, actively pursued through the positive psychology movement. Enhancing the welfare of nursing home workers is a crucial purpose as it is related to minimizing psychological disorders, strengthening overall physical and mental wellness, socializing, proficiently handling disputes, and the commitment to remain in the institution (Hone, Jarden, Duncan, & Schofield, 2015). SWB is the individual's ability to meet spiritual needs, establish balanced relationships with others without spiritual suffering and conflicts, have a meaning and goal in life, and shortly, feel life (Cinar & Eti Aslan, 2017; Coppola, Rania, Parisi, & Lagomarsino, 2021; Kaplan & Arkan, 2020). The lack of research surrounding positive psychology and nursing home nurses' SWB in Iran has prompted a positive intervention to improve the quality of care provided by these nurses. By enhancing their SWB and flexibility in action, this approach aims to better serve this segment of the population. This study aimed to evaluate the effectiveness of positive intervention on SWB of older people in nursing homes.

Methods

The current research was semi-experimental with pretest-posttest design with a control group. The statistical population of the present study included the nurses of the nursing home of Shahrekord City, Iran, in 2016. From this statistical population, 40 people were selected by purposive sampling method and assigned to two experimental (n = 20) and control (n = 20) groups by the random sampling method. The inclusion criteria were as follows: having work experience of over 3 years, age range between 30 and 50 years old, and not suffering from psychological diseases. Exclusion criteria were: having a work experience less than 3 years, absence of over two sessions in therapy sessions, and failure to answer the questionnaire. The therapeutic intervention protocol based on positive psychology was conducted in 12 sessions (Rashid, 2020). In these meetings, acquaintance was first made and the rules and regulations of the meetings and their framework were determined. Then, the basics of positive psychotherapy and its goals, as well as how to identify abilities, strengths and weaknesses, and feelings and emotions in a person's well-being were explained. Then the dimensions of SWB were considered in these meetings. Finally, in the last session, integrating the contents and processes of the previous sessions, explaining the group therapy experience and its effects, getting feedback from the members about their feelings and opinions towards the group, feedback from the members about the end of the group meetings, summarizing and concluding the group therapy, and conducting a post-test were done. Approval was granted by the Ethics Committee of Islamic Azad University, Sharekord Branch (E.8092.000.11251) before the start of the study. Informed consent was taken from all participants in compliance with the Declaration of Helsinki.

Spiritual Well-Being Scale (SWBS): This scale was developed by Ellison and Paloutzian in 1991 as a general indicator of the subjective state of well-being and perceived spiritual quality of life (Ellison & Paloutzian, 1991). It comprises 20 items with 2 subscales: EWB and religious well-being (RWB), with each subscale containing 10 items. The EWB items include such components as having purpose in life, satisfaction, being related with others, and environment surrounding the person, with no specific religious word or concept. The SWBS contains some positive and

some negative items. Scoring is ordered by a 6-point Likert scale as follows: 1) strongly disagree, 2) moderately disagree, 3) disagree, 4) agree, 5) moderately agree, and 6) strongly agree. The negative items are reverse-scored. Based on the sum of the scores, there are 3 scales for this questionnaire: 1) RWB, 2) EWB, and 3) total SWB. The scores for the EWB and RWB scales range between 10 and 60. Therefore, the total score of the SWBS can range from 20 to 120. Less than 10 minutes is required to complete the questionnaire. The researchers categorized the score of the SWBS as low (20-40), moderate (41-99), and high (100-120). For the RWB scale, a score of 10 to 20 reflects a sense of unsatisfactory relationship with God and scores of 21 to 49 and 50 to 60 reflect moderate and positive views of the individual's relationship with God, respectively. For the EWB scale, the same range of scores was categorized as "low satisfaction with life", "relative lack of clarity about purpose in life", and "moderate and high level of satisfaction and purpose in life", respectively. In Iran, Cronbach's alpha for the Spiritual Well-Being Questionnaire (SWBQ) and the SWBS was greater than 0.85. The repeatability of both questionnaires was between 0.88 and 0.98. The Pearson correlation for the SWBQ and the SWBS ranged from 0.33 to 0.53; and all the correlations were significant. The Persian versions of the SWBS and the SWBQ have good reliability, repeatability, and validity to assess spiritual health in the Iranian population (Biglari Abhari, Fisher, Kheiltash, & Nojomi, 2018).

Descriptive statistics and inferential statistics were used to analyze the data in SPSS software (version 25, IBM Corporation, Armonk, NY, USA). The Kolmogorov-Smirnov test was used to check the normality of the data. In addition, Levene's test was used to check the homogeneity of variances.

Results

In this study, the frequency of respondents in the age group of 35-40 with 6 people and 40% frequency in the experimental group and 5 people and 33% frequency in the control group was more than the frequency of other groups. In addition, the frequency of respondents at the bachelor level with 6 people and 40% frequency in the experimental group, and the respondents at the postgraduate level with 8 people and 54% frequency in the control group was more than the frequency of other educational qualifications. Moreover, respondents with a service experience of 5-8 years with 4 people and 27% frequency in the experimental group and 2 people and 13% frequency in the control group had the lowest frequency percentage.

As can be seen in table 1, general descriptive information, such as mean and standard deviation (SD) of pre-test and post-test scores of the experimental and control groups, is shown**.** Levene's test showed a significance level of 0.46 prior to the experiment, and 0.20 after the experiment. This value is greater than the point of 0.05 observed prior to the experiment, which suggests that the variance of the sample was uniform. The homogeneity of regression slopes test indicates that the F value for the independent variable and covariance interaction is 11.92.

Table 1. Mean and standard deviation (SD) of scores obtained from research variables

Variable	Experimental	Stages	Mean ± SD
Spiritual well-being	Control	Pre-test	89.86 ± 12.51
		Post-test	96.38 ± 12.72
	Experimental	Pre-test	88.16 ± 12.43
		Post-test	89.84 ± 12.89

SD: Standard deviation

Table 2. Analysis of covariance (ANCOVA)

	SS	MS	F	P-value	η^2
Spiritual well-being	244.46	244.46	20.89	0.001	0.46
Group	201.91	201.91	17.25	0.001	0.51
Error	432.93	11.70			

SS: Sum of squares; MS: Mean square

However, the obtained significance level exceeding 0.05 suggests a lack of statistical importance. In conclusion, it can be inferred that the presumption of uniformity in regression slope is validated.

As indicated in table 2, the F value shows the significant influence of the independent variable (F = 17.25, P = 0.001). Consequently, there is a significant difference between the mean scores of the two groups in the post-test**.**

Discussion

The study aimed to evaluate the effectiveness of positive intervention on SWB of older people in nursing homes. There was a significant difference between the mean scores of the two groups in the post-test**.** It means that the positive intervention was effective on improving SWB of older people in nursing homes. This finding aligns with the results of previous studies (Kim & Yeom, 2018; Musa, 2017). In his research, Musa (2017) investigated the relationship between spiritual care intervention and SWB from the perspective of Jordanian Muslim nurses using the correlation method (Musa, 2017). The research results showed that SWB was significant for nurses, which had implications for improving the provision of spiritual care interventions. Their SWB is positively related to the repetition of providing spiritual care interventions. In their research, Kim and Yeom (2018) examined the relationship between SWB and job burnout in intensive care unit (ICU) nurses using a multiple regression method (Kim & Yeom, 2018). The results of the research showed that the nurses of the ICU had a high level of job burnout, and SWB and positive psychology helped them improve job burnout. Therefore, burnout has an inverse relationship with well-being. Durmus and Alkan (2021) investigated the relationship between quality of work life, burnout, and SWB in ICU nurses (Durmus & Alkan, 2021). They found that as the SWB levels of nurses working in ICU increased, their burnout levels decreased and their work life quality increased. In addition, it was found that nurses who received spiritual care training had higher work life quality and lower burnout levels than nurses who did not receive training.

Coyle (2002) states that SWB creates a positive frame of mind that leads to meaning, purpose, and healthy behavior (Coyle, 2002). The advantages of being spiritually well can be seen in reduced feelings of anxiety and depression, increased peace, a greater sense of hope and positivity, more meaningful purpose, stronger social connections, and higher satisfaction in marriage. By improving one's spiritual dimension, individuals can fulfill their needs to comprehend and incorporate the significance and direction in their lives (Durmus & Alkan, 2021). Moreover, another study aimed to determine the effect of SWB of ICU nurses on compassion fatigue. It was determined that ICU nurses had a moderate level of compassion fatigue and a high level of SWB. Although especially the educational levels of the nurses contributed to their level of SWB, a younger age and being single and less experienced in the nursing profession and intensive care were identified as significant factors in determining compassion fatigue (Unlugedik & Akbas, 2023). Moreover, SWB is referred to as a supportive state in the attitudes and life goals of

the individuals that establishes a connection between the mind and body of the individual (Coppola et al., 2021). It seems more possible for the individuals with SWB at an optimal level to find a meaning and goal in their lives, be in an inner harmony and peace, and get rid of stress in life (Kim & Yeom, 2018).

The semi-experimental design of the study, small sample size, and participation of only a small group of nursing home nurses working in public and university hospitals in Shahrekord City were the limitations of this study. Drawing general conclusions from the study is challenging because of the limited number of samples, and variables that could have influenced the outcomes were not regulated. It is advisable to explore the present studies carried out in various regions and cultures. It would be worthwhile to study this research with a more extensive sample size and across different cultural backgrounds. Further studies should also focus on improving the treatment and its efficacy.

Conclusion

The results of the research indicated that the training and implementation of the treatment protocol increased SWB. As a result, positive intervention has a positive and significant effect on SWB. In other words, by participating in these meetings and getting familiar with the concept of positive intervention, nurses will get to know their personality traits, and their internal control and SWB will increase.

Conflict of Interests

Authors have no conflict of interests.

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The Effectiveness of Spiritual Intelligence Training on Resilience and Psychological Well-Being of Adolescents with High-Risk Behaviors

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Quantitative Study

Abstract

Background: Psychological interventions may increase resilience and psychological well-being in adolescents with high-risk behaviors. This study aims to investigate the effect of spiritual intelligence training on resilience and psychological well-being in teenagers with high-risk behavior.

Methods: The current research was semi-experimental with a pretest-posttest design with a control group. The statistical population of the research included all teenage girls in the second year of high school who had high-risk behaviors in Tehran Province, Iran. In this study, 30 eligible patients were selected purposefully. The researchers randomly divided the participants into two spiritual intelligence training group (15 people) and the control group (15 people). Experimental group received spiritual intelligence intervention taken from research performed by Zohar and Marshall in eight sessions of 90 minutes once a week for two and a half months, while the control group continued their everyday life and was on the waiting list. Data collection was done using high-risk behaviors of Iranian teenagers questionnaire, the Connor-Davidson Resilience Scale (CD-RISC), and Ryff Psychological Well-Being Scale. The data were compared using multivariate and univariate analysis of variance (ANOVA). All statistical analyses were performed in SPSS software.

Results: Spiritual intelligence training intervention was effective on resilience ($F = 19.63$, $P = 0.001$, $\eta^2 = 0.625$) and psychological well-being ($F = 28.54$, $P = 0.001$, $\eta^2 = 0.672$). The results showed that using spiritual intelligence training increased resilience and psychological well-being in teenagers with high-risk behavior.

Conclusion: Using spiritual intelligence training increases resilience and psychological well-being in teenagers with high-risk behavior. Therefore, spiritual intelligence training is

recommended for teenagers with high-risk behavior to increase resilience and psychological well-being and improve their quality of life.

Keywords: Spiritual; Resilience; Psychological well-being; High-risk behaviors

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Introduction

Adolescence is a period that can be stressful due to physical and psychological changes and changes that occur in the brain. During this period, the teenager may react unexpectedly to distress and stress. Moreover, in this period, severe and irreparable damages may lead to behavioral problems and risky behaviors (Noury Ghasemabadi & Seydavi, 2021). The excessive spread of multidimensional developments and the high impact of students on destructive emotions and the actions of their peers facilitate the formation of high-risk behaviors such as suicide, drug addiction, theft, and running away from home in this group (Guo et al., 2023). According to previous studies, the prevalence rate of risky behaviors in Iran has reached 23% (Marzban, 2022).

The investigation of the research background showed that resilience could be effective in the occurrence of high-risk behavior (Arat & Wong, 2019). Resilience is a set of personality traits and coping styles that are usually used in facing and enduring situations and are effective in difficult life and help a person to have a more successful adaptation under challenging conditions (Joulaei et al., 2022). The findings of Joulani et al. (2022) study showed that increased resilience and mental health through training led to the prevention of personal injuries and the reduction of risky behaviors (Joulaei et al., 2022). Studies by Ross et al. (2023) have been conducted to identify vulnerability and protective processes to reduce health-damaging behaviors in adolescents, and it has been shown that resilience is an essential element in adapting and reducing risky behaviors (Ross, Scanes, & Locke, 2023).

The literature provides different measures and indicators of mental health, including psychological well-being, broadly covering the entire mental health continuum. Definitions of psychological well-being and the measures used in the literature vary (Panicheva, Mararitsa, Sorokin, Koltsova, & Rosso, 2022). One frequently used measure of psychological well-being is the World Health Organization Well-Being Index (WHO-5), which measures not only negative aspects, such as the presence of depression symptomology, but also positive aspects, such as positive mood, vitality, and interest (Topp, Ostergaard, Sondergaard, & Bech, 2015). A Slovenian survey reported the highest prevalence of poor psychological well-being in those aged 18 to 29 years compared to all other age groups. This study also revealed poorer psychological well-being among participants with chronic health conditions (Panicheva et al., 2022). Resilience is an essential building block of psychological well-being, and positive relationships between these two constructs have been found in different studies (Topp et al., 2015). Moreover, recent studies have identified resilience as essential to coping with mental health challenges (Ran, Wang, Ai, Kong, Chen, & Kuang, 2020).

One of the factors that can play a role in psychological well-being and resilience is the role of spiritual teachings and, as a result, spiritual coping methods. In the hearts and minds of all people, spirituality can be seen everywhere in religious habits and behaviors and has a significant positive impact on their lives. Having meaning and purpose in life, enjoying social and spiritual support, feeling belonging to a definitive source, having a good spiritual life, etc., are ways to reduce the damage to stressful events in life (Watts & Dorobantu, 2023). Andrei (2023) concluded that religious orientation, especially inner orientation, could strongly predict psychological well-being and resilience (Andrei, 2023). Regarding the consequences of spirituality and religiosity, several studies have pointed to increased mental health and life satisfaction (Watts & Dorobantu, 2023). Considering the increasing growth of studies in the field of positive psychology in the world and the little research history of this field of study in Iran, this research was conducted to assess the effectiveness of spiritual intelligence training on resilience

and psychological well-being of adolescents with high-risk behaviors.

Methods

The present research method was a semi-experimental type with a pretest-posttest design. The statistical population of the research included all teenage girls in the second year of high school who had high-risk behaviors in Tehran Province, Iran. Based on the result of the previous study with a mean difference of 8 and standard deviation (SD) of 2.40, power of 0.8, probability of type one error of 0.05, and attrition rate of 10%, a total of 30 samples were calculated. The inclusion criteria were female gender, having the age range of 16-18 years, attending the second secondary course, obtaining a high score in the high-risk behavior questionnaire (one SD above the average), not using psychiatric drugs, and willingness to participate in the study. Besides, the exclusion criteria were having more than two absent sessions, non-cooperation and not doing the specified tasks, unwillingness to continue participating in the research process, and the occurrence of an unwanted incident that could cause disruption.

Procedure: In this research, after obtaining permission from the Department of Education and Culture of Tehran Province, by referring to girls' schools in the second year of high school in Tehran Province, a questionnaire of high-risk behaviors was distributed among the students of these schools. After collecting and scoring the questionnaires and removing incomplete and distorted questionnaires, the students who scored higher than the cutoff score of the high-risk behaviors questionnaire were identified (one SD above the mean) in the last step. Thirty people were selected through purposive sampling and assigned to two experimental and control groups randomly. Each participant received an envelope containing a number and an identifier randomly chosen to determine whether they were in the experimental group (n = 15) or control (n = 15). Participants were informed about the research project. To protect the privacy of patient data, the researchers assured them that their data would be confidential. In the next step, the people of the experimental group received spiritual intelligence intervention taken from research performed by Zohar (2012) in eight sessions of 90 minutes once a week for two and a half months, while the control group continued their everyday life and was on the waiting list (Zohar, 2012). The structure of the training sessions is described in table 1. Finally, after collecting the data, the training was given to them in brochure format.

High-risk behaviors of Iranian teenagers questionnaire (2009): This questionnaire was created by Zadeh Mohammadi and Ahmad Abadi in 2009, based on the adolescent risk-taking questionnaire and considering the cultural conditions and social limitations of the Iranian society (Zadeh Mohammadi & Ahmad Abadi, 2009). This scale has 38 items to measure the vulnerability of teenagers against seven categories of high-risk behaviors (dangerous driving, violence, smoking, drug use, alcohol consumption, orientation towards the opposite sex, and sexual relations). The respondents express their agreement or disagreement with these items on a scale of 5 from completely agree = (5) to completely disagree = (1). Zadeh Mohammadi and Ahmad Abadi confirmed the validity of the risk-taking questionnaire of Iranian teenagers by using the construct validity of the exploratory factor analysis method, as well as Cronbach's alpha scale of this questionnaire for dangerous driving, 0.74 for cigarettes, 0.93 for narcotic drugs, and 0.90 for psychotropic substances. Friendship with the opposite sex was 0.90, and sexual relationship and behavior were 0.87. The reliability of the questionnaire in this study using Cronbach's alpha was calculated at 0.89. (Zadeh Mohammadi & Ahmad Abadi, 2009).

Table 1. Teaching spiritual intelligence protocol sessions

Sessions	Contents
1	Participants were asked to introduce themselves. In the second stage, a brief description of 8 sessions was given to them, and explanations were given about the concepts of resilience, psychological well-being, and spiritual intelligence and the relationship between them.
2	At the beginning of the second session, the participants were encouraged to do body meditation. Then explanations were given about the benefits of spiritual intelligence and its effects on improving daily performance.
3	At the beginning of the third session, the participants were encouraged to do body meditation. Then mental imagery and the way to enter spiritual states were taught. Finally, sitting meditation and a body scan were done.
4	This session started with sitting meditation, paying attention to breathing, body sounds, and thoughts, also called four-dimensional sitting meditation
5	Participants were asked to do sitting meditation. In the following, effective coping responses, mental imagery and indoctrination, and the ability to use spiritual intelligence resources to solve daily life problems were taught.
6	The session started with a three-minute breathing exercise. Then stress and anger management with a spiritual approach, and pious behaviors such as forgiveness, gratitude, patience, etc. were taught and discussed.
7	This session started with four-dimensional meditation and awareness of everything that comes into consciousness at the moment.
8	The session started with body scan meditation. Then there was a discussion about how to use what they have learned so far.

Friendship with the opposite sex was 0.90, and sexual relationship and behavior was 0.87. The reliability of the questionnaire in this study using Cronbach's alpha was calculated at 0.89.

The Connor-Davidson Resilience Scale (CD-RISC): The scale is a 25-item instrument that measures resilience structure in a five-point Likert-type from zero to four, with zero being the minimum resilience score (Connor & Davidson, 2003). Therefore, the range of test scores is between 0 and 100. Higher scores indicate higher resilience of the subject. The factor analysis results show that this test has five factors: personal competence, high standards, and tenacity, trust in one's instincts, tolerance of negative affect and strengthening effects of stress, positive acceptance of change and secure relationships, control, and spiritual influences. CD-RISC authors found that test-retest reliability [intraclass correlation coefficient (ICC) = 0.87] and internal consistency (α = 0.89) were acceptable (Connor & Davidson, 2003). Additionally, Yu and Zhang (2007) reported a strong internal consistency coefficient (α = 0.89) for their sample of Chinese adolescents (Yu & Zhang, 2007). In this study, Cronbach's α coefficient of the scale was 0.967. Haghranjbar et al. (2011) estimated the reliability of the Conner and Davison scale as 0.89, using Cronbach's alpha, and also its validity was satisfactory (Haghranjbar, Kakavand, Borjali, & Bermas, 2011). The reliability of the questionnaire in this study using Cronbach's alpha was calculated at 0.88.

Ryff Psychological Well-Being Scale: The short version of the 18-question Ryff Psychological Well-Being Scale was designed in 1995 and revised in 2002 (Ryff & Keyes, 1995). This version consists of 6 factors (independence, mastery of the environment, personal growth, positive communication with others, purpose in life, and self-acceptance). The total score of these six factors is calculated as the total psychological well-being score. This test is a self-assessment tool that is answered in a 6-point continuum from "agree" to "completely disagree", where a higher score indicates better psychological well-being. Out of all the questions, ten questions are scored directly, and eight questions are scored in reverse. The correlation of the short version of Ryff's Psychological Well-Being Scale with the significant scale has

fluctuated from 0.7 to 0.89 (Ryff & Keyes, 1995). Iranian questionnaire's psychometric indicators have also been reported as favorable (Khanjani, Shahidi, Fathabadi, Mazaheri, & Shokri, 2014). The internal consistency of this scale using Cronbach's alpha was 0.71%. The reliability of the questionnaire in this study using Cronbach's alpha was calculated at 073.

Spiritual intelligence can aid an individual to choose the correct path to accomplishing objectives in the face of crises and problems considering personal priorities and values. Since adolescence is a critical and sensitive period in regard to the path of life decisions, besides widening the spiritual solutions and methods of coping with pressures and hardship, it seems to relieve individuals from their distress and crises (Shateri, Hayat, & Jayervand, 2019).

In this study, descriptive and inferential statistics were used to analyze data. The mean and SD and the analysis of covariance (ANCOVA) test (to control pre-test scores) were used for inferential statistics in descriptive statistics. Normal distribution was assessed using Kolmogorov-Smirnov test. Multivariate analysis of variance (MANOVA) was used to assess the effect of an intervention on two dependent variables. Then, univariate ANCOVA was used to separately assess the effect of an intervention on dependent variables adjusted for baseline values. The variance homogeneity assumption was assessed using Levene's test. The multivariate equality of covariance matrices was evaluated using Box's M. All statistical analyses were performed in SPSS software (version 26, IBM Corporation, Armonk, NY, USA).

Results

The age range of participants was from 14 to 18 years in experimental (mean = 16.43, SD = 1.25) and control (mean= 16.39, SD = 1.12) groups. The female gender only participated in this study as inclusion criteria. Most individuals were in ten (n = 8, 26.6%) and eleven (n = 12, 40%) school grades.

Table 2 shows the pretest and posttest values of resilience and psychological well-being scores for the experimental and control groups. There was no significant difference between the two groups in pretest values in terms of resilience and psychological well-being.

Considering dependent variables, table 3 shows a significant difference between the test and control groups at a $P \leq 0.001$. As a result, at least one of the dependent variables differs significantly between the two groups (resilience and psychological well-being). In multivariate ANCOVA (MANCOVA) text, two covariance analyses were conducted to determine this difference.

Table 2. Mean and standard deviation (SD) of variables in experimental and control groups

Variable	Groups	Statistical index	Mean ± SD
Resilience	Pre-test	Control	70.94 ± 8.43
		Experimental	71.22 ± 8.05
	Post-test	Control	71.25 ± 8.99
		Experimental	86.14 ± 8.74
Psychological well-being	Pre-test	Control	44.17 ± 7.81
		Experimental	45.52 ± 7.39
	Post-test	Control	45.60 ± 7.11
		Experimental	64.74 ± 8.25

SD: Standard deviation

Table 3. Results of multivariate analysis of covariance (MANCOVA) on variables

Test statistic	Value	F	df	df error	P-value	Effect size	Eta
Pillai's trace	0.709	43.17	2	28	0.001	0.673	1
Wilks' lambda	0.253	43.17	2	28	0.001	0.673	1
Hotelling's trace	7.360	43.17	2	28	0.001	0.673	1
Roy's largest root	6.120	43.17	2	28	0.001	0.673	1

df: Degree of freedom

In the experimental and control groups, 67.3% of the variances are explained by the independent variable based on the calculated effect size. A test with a statistical power of 1.00 rejects the null hypothesis with 100% power.

According to table 4, spiritual intelligence group therapy findings had a favorable and substantial impact on resilience (P = 0.001, F = 19.63) and psychological well-being (P = 0.001, F = 28.54) in adolescents with risky behavior. In addition, it can be seen that the most significant effect size is related to the psychological well-being variable (0.672), and the smallest effect size is related to resilience (0.625), which shows that 49% of the total variances of the experimental and control groups in the variable of the resilience of adolescents with risky behaviors is caused by the effect of the independent variable.

Discussion

The present study examined the effectiveness of spiritual intelligence training on resilience and psychological well-being of adolescents with high-risk behaviors. The data analysis findings show that spiritual intelligence training improves resilience and psychological well-being in adolescents with high-risk behaviors. The obtained results were in line with studies carried out by Andrei (2023), Seena and Sundaram (2018), Sreeja and Jain (2019), and Watts and Dorobantu (2023).

It is important to note that spiritual intelligence is a capacity that all people benefit from to an extent and with which they understand their most profound concepts, goals, and highest motivations, which leads to a deeper sense of meaning and purpose (Watts & Dorobantu, 2023). Spiritual intelligence has become adaptive in daily life, and a large part of this adaptive action is the result of answering existential questions and finding meaning and purpose in life's activities and events. In fact, improving spiritual intelligence causes deep self-awareness of different layers and dimensions of oneself, checking one's goals, paying attention to intuitive messages and signs, and finding meaning in external experiences (Andrei, 2023). The first finding about the effectiveness of spiritual intelligence training in promoting adolescents' resilience to high-risk behaviors was consistent with the study of Seena and Sundaram (2018), which showed that spiritual intelligence training improved emotional intelligence and resilience in misbehaving adolescent girls (Seena & Sundaram, 2018). In order to explain the current findings, according to Sreeja and Jain (2019), it can be said that spiritual skills, by affecting the situation evaluation, cognitive evaluation of the person, coping activities, support resources, etc., can reduce anxiety and the feeling of vulnerability in a person.

Table 4. Results of analysis of covariance (ANCOVA) in the multivariate ANCOVA (MANCOVA) context

Dependent variable	SS	df	MS	F	P-value	Effect size
Resilience	1465.34	1	146.345	19.63	0.001	0.625
Psychological well-being	1271.62	1	127.621	28.54	0.001	0.672

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

In addition, Pearce et al. (2015) have shown in their research that spirituality has effectively reduced mental illnesses such as depression, anxiety, anxiety-related injuries, stress, hostility, and psychosomatic illnesses and has increased mental health and resilience (Pearce et al., 2015).

The results of the present study also showed that the intervention of spiritual intelligence instruction was effective in the enhancement of resilience and psychological well-being in adolescents with high-risk behavior by enriching life with meaning and creating a purpose, which was consistent with the results of prior studies (Alrashidi et al., 2022; Herren et al., 2019; Ibrahim, Sanuddin, Zohri, Salim, & Mohamad, 2022; O'Sullivan & Lindsay, 2023).

Herren et al.'s study (2019) results are in this direction. They showed that spiritual intelligence led to a higher experience of flexibility and patience. People with patience in facing stress do not lose control and do not get frustrated (Herren et al., 2019). They solve problems related to anxiety-provoking situations adaptively. People with higher spiritual intelligence value life experiences, feel more in control of life events and have more resistance, and have higher mental health and psychological well-being (Sreeja & Jain, 2019). Accordingly, adolescents with high-risk behaviors can improve their spiritual intelligence, find meaning in life, and achieve higher resilience and psychological well-being. Regarding psychological well-being, the current research findings showed that training to improve spiritual intelligence had a statistically significant effect on the well-being of this variable. This finding was consistent with the results of Ibrahim et al. (2022) research (Ibrahim et al., 2022). They proved that applying spirituality in daily life led to an increase in a person's adaptability and an improvement in his psychological well-being. To explain the present findings, spiritual intelligence is a shield against psychological problems through the creation and expansion of positive emotions, and thus increases the psychological well-being and happiness of people. This approach creates meaning, reduces psychological problems, and increases happiness and adaptive coping power (Alrashidi et al., 2022).

Spirituality by influencing coping strategies, document styles, communication with the surrounding environment, and feeling meaningful in life, is related to reducing negative emotions and increasing mental health, well-being, and happiness (O'Sullivan & Lindsay, 2023). Previous findings show that a spiritual intelligence teaching approach can be successfully implemented in clinical settings (Sreeja & Jain, 2019). Based on this, Ajele et al. (2021) investigated the psychological well-being of patients with diabetes before and after the intervention, considering psychological and social well-being, life satisfaction, psychological happiness, and ontological well-being (Ajele, Oladejo, Akanni, & Babalola, 2021). The results of the studies showed that increasing spiritual intelligence effectively improved the psychological well-being of patients, significantly increased their mental health and resilience, and reduced their depression. The intervention group significantly improved their well-being, while the control group did not. In a study conducted by Midi et al. (2019) on the effect of spiritual intelligence on young people's educational progress and psychological well-being, the findings showed that spiritual intelligence could promote psychological well-being and academic progress (Midi, Cosmas, & Sinik, 2019).

This study has limitations, such as the limited number of adolescents with high-risk behaviors in Tehran, the absence of random sampling methods, and the lack of follow-up. Therefore, other studies should be conducted in this field to generalize the results at the research level better. It is recommended to replicate this study in

various cities and regions with diverse cultures, focusing on different women and utilizing follow-up and random sampling for generalizing the findings. .

Conclusion

The results indicate a significant effect of spiritual intelligence training on resilience and psychological improvement of adolescents with high-risk behaviors. According to the findings of this study, at the functional level, it is recommended that schools and families improve the psychological components of adolescents by focusing on the components of spiritual intelligence.

Conflict of Interests

Authors have no conflict of interests.

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Is Obesity a Risk Factor of Bullying at Intermediate School?

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Quantitative Study

Abstract

Background: Bullying is aggressive behavior carried out by an individual or a group of people against another person or another group. This study was conducted to assess the prevalence of bullying related to obesity among intermediate school pupils.

Methods: In the Ha'il region of Saudi Arabia in the year 2022, a cross-sectional study was conducted at governmental intermediate schools. The study involved 1089 students (566 girls and 523 boys) who successfully completed the research out of an initial total of 1275 students. About 10% of the initial sample was excluded due to missing data, 5% because of bullying unrelated to obesity, and 2% due to experiencing bullying outside of the school setting. Statistical analyses were carried out using the SPSS® software. To discern differences among bullying groups across various variables, one-way and two-way repeated measures analysis of variance (ANOVA) were used. The correlation between body mass index (BMI) and bullying was assessed using bivariate Pearson's product-moment correlation to check for collinearity. All statistical tests were two-sided, and a type I error (α) of 0.05 was applied.

Results: A positive correlation between BMI and bullying ($r = 0.058$; $P = 0.040$) was reported. The overall rate of bullying was 31% with the most prevalent type of bullying being verbal (77.5%) followed by physical (14.8%) and social (7.7%). Moreover, students of 15 years of age were more at risk of being bullied than their peers (12.4%). However, no significant difference related to sex or educational level variables was reported. Moreover, the results indicated that 94% of the students who were bullied did not get enough sleep (> 7 hours; $P < 0.001$). ANOVA indicated that 86.9% of students experiencing bullying resort to eating when facing stress and tension. Additionally, 52% of bullied students exhibit irregular eating habits, foregoing regular meals.

Conclusion: In the present study, a high prevalence rate of bullying related to obesity among schoolchildren was reported. Therefore, mandatory serious efforts should be undertaken in the region by educational staff (i.e., teachers), health care providers, and

decision-makers to deal with the problem. Additionally, health programs need to be endorsed in schools for the prevention and management of childhood obesity in the region.
Keywords: Bullying; Obesity; Adolescent

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Introduction

The public health of children and adolescents in developing and developed countries is facing a major challenge represented by the high rates of obesity (Mechraoui et al., 2023; Robinson et al., 2017). Althumiri et al. (2021) conducted a survey in Saudi Arabia to identify the prevalence of obesity among the population and it was found that 21.7% suffer from increased body mass index (BMI; ≥ 30), and that 20.1% of the population of the Ha'il region, where the current study is conducted, suffer from obesity. In a more recent study, Abedelmalek, Adam, Alardan, Yassin, Chtourou, and Souissi (2022) found that Ha'il City has a 52.1% prevalence of obesity, and this is associated with factors such as lack of physical activity, disrupted sleep, and unhealthy eating habits. Understanding the risk factors for obesity in the early years is crucial to the development of preventive plans and programs, and the development of interventions provided by parents, educational staff, and those concerned with mental and physical health issues of children and adolescents (Wright, 2021).

The most prominent effects of obesity on the health of individuals are its association with numerous chronic diseases (Lee, Jeong, & Roh, 2018). Moreover, obesity has numerous psychological effects, including problems of low self-confidence and self-esteem, psychological disorders related to mood and emotional aspects such as anxiety and depression, in addition to eating disorders, social isolation, and low educational attainment (Lee et al., 2018). In children and adolescents, the body is positively associated with the inability to manage emotions and control impulsive behavior, in addition to weak cognitive functions such as attention (Pan, Li, Feng, & Hong, 2018). Several factors are involved in the prevalence of obesity among children, including a diet that relies on excessive consumption of fast food and drinks that depend on sugar and fats (Paeratakul, Ferdinand, Champagne, Ryan, & Bray, 2003). A previous study showed an association between obesity and the time children and adolescents spend playing video games or using computer and Internet applications (Vicente-Rodriguez et al., 2008). Excessive media exposure reduces physical activity and increases food consumption (Strasburger, 2011). Overweight and obese school-aged children have both psychological and physical symptoms (Aljaadi & Alharbi, 2020), and experience negative body image and bullying (Jansen et al., 2016).

Although negative appreciation of obese individuals has been well documented (Alsaleem, Alhashem, Alsaleem, & Mahfouz, 2021), the relationship between bullying and obesity has received little attention in the past decade (Brixval, Rayce, Rasmussen, Holstein, & Due, 2012). Evidence suggests that adolescents who are overweight or obese are more likely to be bullied at school than to be abused for other reasons (e.g., race, religion, or disability) (Krukowski, West, Philyaw, Bursac, Phillips, & Raczynski, 2009). In an earlier investigation, Strauss and Pollack (2003) highlighted that adolescents between the ages of 13 and 18 who were overweight had a higher likelihood of experiencing psychosocial issues and social isolation. Additionally, these overweight adolescents were found to be more susceptible to verbal abuse from their peers (Rankin et al., 2016). In addition, weight-based bullying in overweight or obese children and adolescents may contribute not only to peer rejection and academic failure (Puhl & Heuer, 2009), but also to negative effects such as increased risk of disordered eating behaviors and limited physical activity. A meta-analysis showed that both overweight and obesity among young people are risk factors for being a victim of bullying with no difference between boys and girls (van Geel, Vedder, & Tanilon, 2014). Certain types of peer victimization, often

referred to as bullying, include physical, verbal, and relational/social types (Alsaleem et al., 2021). A Brazilian national survey showed that school students reported being bullied by their peers because of their excess weight, and that 46% of students aged 11 to 15 years experienced bullying due to an increased BMI (Russo, 2020).

Data regarding bullying among adolescents in the Ha'il region are lacking. Therefore, it is crucial to examine bullying to minimize children's and adolescents' mental health problems and difficulties in adulthood. The aim of the current study was to assess bullying related to obesity or overweight among intermediate students in Ha'il region, Saudi Arabia.

The high prevalence of obesity (Abedelmalek et al., 2022a) and the commonness of bullying in school call for research to address this knowledge gap. The purpose of this study was to examine whether obesity predicts the bullying among students aged 11 to 15 years. We hypothesized that students with a high BMI are more vulnerable to bullying.

Methods

Study design and participants: This cross-sectional study encompassed 1089 adolescents, randomly chosen from various schools in Ha'il city, Kingdom of Saudi Arabia. The inclusion criteria comprised students in selected classes who were in good health and devoid of physical deformities. Spanning four months, from January to April 2022, the study obtained consent from schools and approval from both students and their parents. Assurances were given to participants that their data would be solely utilized for research purposes. Adhering to Google's privacy policy (https://policies.google.com/privacy?hl=en), participant responses were treated as anonymous and confidential. Participants had the autonomy to discontinue the study and exit the questionnaire at any point before submission, using only the "submit" button to save responses. By completing the survey, participants expressed their voluntary consent. Honesty in responses was strongly encouraged (Ammar et al., 2020).

Sample Size: A total number of 1275 students were assessed for eligibility. A 10% exclusion from the study occurred due to missing data, 5% due to bullying unrelated to obesity, and 2% due to incidents of bullying outside the school context. This cross-sectional study involved 1089 healthy adolescents (566 girls and 523 boys) aged 12–16 years, who were Saudi students without disabilities or physical deformities. The participants were randomly selected from various schools in Ha'il, a city situated in the eastern borders region of the Kingdom of Saudi Arabia.

Instruments and variable: Anthropometric measurements were conducted in the morning by a skilled researcher following written standardized protocols. Body weight was assessed using a digital scale (Tanita Corporation, Tokyo, Japan) with a precision of 0.1 kilogram. Height was measured to the nearest centimeter while the subject stood fully upright (Frankfort horizontal plane) without shoes utilizing a calibrated portable stadiometer. BMI was computed as the ratio of weight in kilograms to the square of height in meters. A pre-structured questionnaire was used which collected information regarding demographic characteristics (i.e., sex, age, and educational level) and daily leisure activities (i.e., PlayStation, and exercise practice). The participants were also asked about their exposure to bullying and the reason for it (Table 1). The Arab Teens Lifestyle Study (ATLS) research tool was employed to gather lifestyle information, specifically focusing on the initial 5 items requiring measurement/recording. The reliability of the Arabic version was assessed, yielding a Cronbach's alpha of 0.725.

Table 1. The characteristics of the study sample (n = 1089)

Category		n (%)	Mean ± SD
Sex	Boys	523 (48.0)	29.27 ± 10.12
	Girls	566 (52.0)	27.38 ± 9.27
Educational level	First	467 (42.9)	27.66 ± 9.677
	Second	366 (33.6)	28.51 ± 9.60
	Third	256 (23.5)	29.08 ± 9.96
Age	12	193 (17.7)	26.60 ± 9.42
	13	302 ()27.7	28.70 ± 9.71
	14	370 (34.0)	28.35 ± 9.57
	15	207 (19.0)	28.90 ± 10.01
	16	17 (1.6)	30.19 ± 11.97
BMI	Normal	478 (43.9)	29.82 ± 9.34
	Overweight	137 (12.6)	29.75 ± 10.24
	Obesity	474 (43.5)	26.30 ± 9.62
Bullying	Yes	337 (40.0)	27.44 ± 9.44
	No	752 (60.0)	28.67 ± 9.84

BMI: Boy mass index; SD: Standard deviation

Only sleep data were scrutinized and presented, defining insufficient sleep as less than 7 hours per night based on the National Sleep Foundation's criteria for the adolescent population (National Sleep Foundation, 2020). For dietary information, the Self-Report Diet Questionnaire, using NutriCalc questionnaire (2020), was utilized. This questionnaire was designed to explore eating and food habits, such as the number of meals per day, stress eating, and weekly consumption of fast food. In this study, emphasis was placed on items pertaining to stress eating for methodological reasons.

Analysis: Descriptive statistics were calculated to characterize the percentage of responses for each question and the overall distribution in the total score of each questionnaire. All statistical analyses were performed using the SPSS® software (version 20.0; IBM Corp., Armonk, NY, USA). The normality of data distribution was confirmed through the Shapiro–Wilk test. Results were calculated and presented as mean ± SD (standard deviation) and frequency counts (%) for all variables. A t-test was used to determine the difference between the means. To identify the differences between bullying groups according to all variables, one-way and two-way repeated measures analysis of variance (ANOVA) were used. The Mann-Whitney U test was performed to analyze the differences in bullying according to life activities variables. The Tukey's post hoc test was conducted in cases where significant effects or interactions were observed.

Linear regression was employed to ascertain the nature and strength of the relationship between bullying and obesity. The collinearity between BMI and bullying was assessed through the calculation of the bivariate Pearson's product-moment correlation (r). All statistical tests used were two-sided with a type I error (α) of 0.05.

Ethics: All official authorizations necessary to conduct this study were obtained. The project was approved by the research ethical committee of Ha'il University (RG-20 171).

Results

Prevalence of bullying: Concerning the prevalence of bullying among schoolchildren (Figure 1), the t-test showed that 40% of students were bullied (t = 3447.07; P < 0.0001) (Table 2). Moreover, Pearson's correlation test reported a positive correlation between BMI and bullying (r = 0.058; P = 0.040; Table 3).

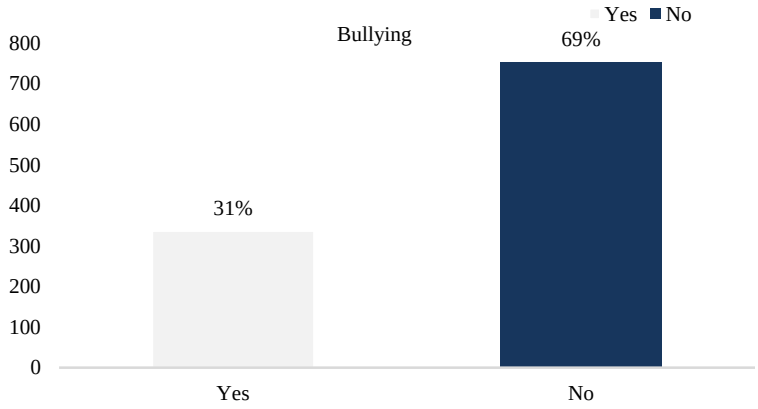

Figure 1. Percentage of middle school students being bullied

Table 2. The prevalence of bullying among the study sample (n = 1089)

Category		n	Mean ± SD	df	t	P-value
Bullying	Yes	337	69.00 ± 0.462	1	-3447.074	< 0.001
	No	752		1087		

df: Degree of freedom; SD: Standard deviation

Linear regression standards were used to determine whether it is possible to predict bullying through BMI. The results of the regression indicated that the two predictors explained 37.4% of the variance [R^2 = 0.37; F = (1,108) = 652.2; P < 0.0001)]. It was found that BMI significantly predicted bullying (β = 1.23; t = 25.53; P < 0.010; Table 4). Obese students were more exposed to bullying, according to BMI with a percentage of 28.1% (Table 5). The most prevalent type of bullying was verbal (77.5%), followed by physical (14.8%) and social (7.7%) types (Figure 2).

Differences in bullying by demographic variables: In the assessment of the differences in bullying by demographic variables, t-test and ANOVA revealed no significant differences in terms of sex (t = -1.160; P = 0.246) (girls: 1.67 ± 0.47 and boys: 1.70 ± 0.45; Table 6). In addition, no significant difference was observed in terms of educational level (1.80 ± 0.79; F = 0.428; P = 0.652). However, a significant difference in terms of the age variable was observed (13.58 ± 1.03; F = 2.75; P = 0.018). In fact, a high level of bullying was observed in students in the 15-year-old group (Table 7).

Table 3. Relationship between increased BMI and bullying

R	R Square	Adjusted R Square	SE of the Estimate	P-value
0.058	0.003	0.003	0.46190	0.040

SE: Standard error

Table 4. The linear regression between BMI and bullying

Model Summary[b]									
Model	R	R Square	Adjusted R Square	SE of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	F Change (P-value)
1	0.612[a]	0.375	0.374	0.73983	0.375	652.249	1	1087	0.000

a. Predictors: (Constant), Bullying
b. Dependent Variable: BMI
df: Degree of freedom; SE: Standard error

Table 5. Differences in bullying according to BMI in the study sample (n = 1089)

Category		Normal	Overweight	Obesity
		(n/%) /Mean ± SD	(n/%) /Mean ± SD	(n/%) /Mean ± SD
Bullying	Yes	(19/1.74) 1.31 ± 0.47	(12/1.10) 1.41 ± 0.51	(306/28.10) 1.46 ± 0.49*
	No	(459/42.14) 1.49 ± 0.50	(125/11.47) 1.51 ± 0.50	(168/15.42) 1.48 ± 0.50*

*(P < 0.05): significant difference compared to normal and overweight students
SD: Standard deviation

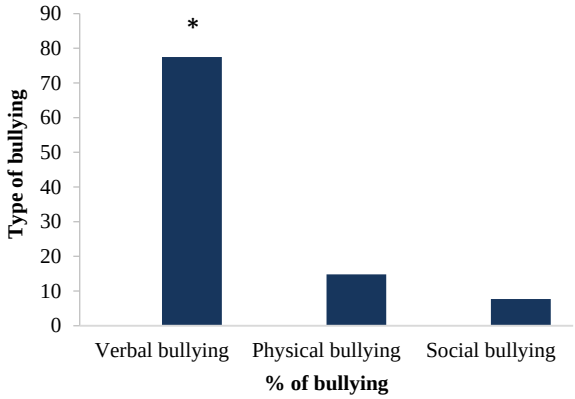

Figure 2. The percentage (%) of different types of bullying (i.e., verbal, physical, and social) of the study sample (n = 1089)
*(P < 0.05): significant difference compared to physical and social bullying

Differences in the bullying according to life activities variables: Concerning the differences in bullying according to life activities variables, the Mann-Whitney U test showed significant differences related to exercise practice with a high average observed in students who answered "No" (U = 83108; P < 0.0001; Figure 3). The lower the practice of physical exercise was, the more obese the students were, with a percentage of 38% (Table 8).

For the PlayStation variable, a significant difference was observed (U = 90819; P < 0.0001). It was reported that 87.5% of students (n = 337) who were bullied spent their time playing with the PlayStation (Table 9).

Table 6. Differences in bullying according to sex in the study sample (n = 1089)

Category		Mean ± SD	df	t	P-value
Sex	Girls	1.60 ± 0.46	1	-1.160	0.246
	Boys	1.70 ± 0.45	1087		

df: Degree of freedom; SD: Standard deviation

Table 7. Differences in bullying according to educational level and age of the study sample (n = 1089)

Category		Sum of squares	Mean of square	df	F	P-value
Educational level	Between Groups	0.183	0.092	2	0.428	0.652
	Within Groups	232.529	0.214	1086		
	Total	232.713		1088		
Age	Between Groups	2.920	0.584	5	2.753	0.018
	Within Groups	229.792	0.212	1083		
	Total	232.713		1088		

df: Degree of freedom

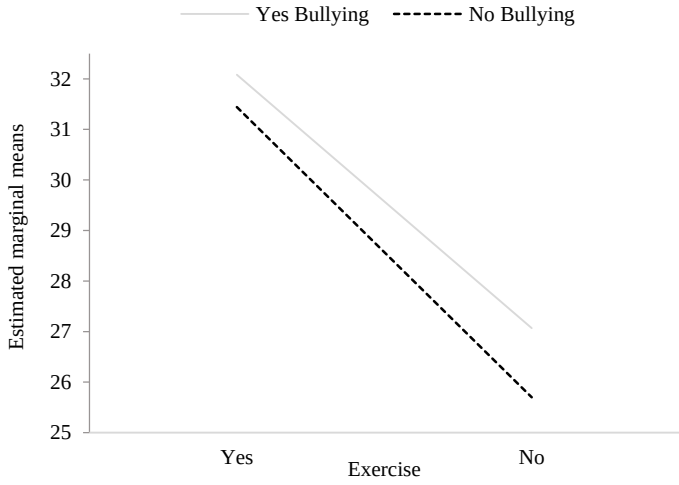

Figure 3. Differences in bullying according to exercise practice

Differences in Bullying Based on Sleep Patterns: The findings revealed that 423 students had sleep duration of less than 7 hours, while 666 students reported obtaining sufficient sleep (more than 7 hours, as shown in Table 10). Among the students who experienced bullying, 319 had sleep duration of less than 7 hours, and only 19 students reported sleeping more than 7 hours.

The results highlight that 94% of students who faced bullying did not get adequate sleep (less than 7 hours). There are statistically significant differences in bullying according to the variable of hours of sleep (M = 27.31 ± 9.51) (F = 1549.52; P = 0.0001) (Table 11).

Differences in Bullying Based on Eating Habits: Table 12 presents the variables related to dietary habits. The one-way ANOVA indicated that students who affirmed waking up at night to eat were the most susceptible to bullying, constituting approximately 88.13% of the total participants experiencing bullying (27.14 ± 9.49; F = 429.77; P = 0.0001). The divergences between results demonstrated that individuals facing bullying tend to consume food when experiencing elevated stress and tension, making up 86.9% of the total students exposed to bullying (26.89 ± 9.39; F = 341.42; P = 0.0001).

Table 8. Description of exercise practice according to BMI of the study sample (n = 1089)

Category		Normal	Overweight	Obesity
		(n/%) /Mean ± SD	(n/%) /Mean ± SD	(n/%) /Mean ± SD
Exercise	Yes	(281/25.80) 30.95 ± 9.20	(71/6.51) 33.17 ± 10.19	(60/28.10) 31.95 ± 10.18*
	No	(197/18.10) 28.22 ± 9.27	(66/6.06) 26.07 ± 8.99	(414/38.10) 25.48 ± 9.26*

*(P < 0.05): significant difference compared to normal and overweight students
SD: Standard deviation

Table 9. Differences in bullying according to life activities variables of the study sample (n = 1089)

Categories		n	Mean Rank	Sum of Ranks	Mann-Whitney U	P-value
Exercise	Yes	412	681.78	280894.00	83108.000	< 0.001
	No	677	461.76	312611.00		
Play Station	Yes	639	462.13	295299.00	90819.000	< 0.001
	No	450	662.68	298206.00		

Table 10. Description of sleep pattern according to bullying of the study sample (n = 1089)

Category		Yes Bullying	No Bullying
		(n/%) /Mean ± SD	(n/%) /Mean ± SD
Sleep	Less than 7 hours	(319/29.29) 27.31 ± 9.51*	(104/9.55) 26.10 ± 10.73
	More than 7 hours	(18/1.65) 29.63 ± 7.97*	(648/59.50) 29.07 ± 9.63

*(P < 0.05): significant difference compared to no bullied students
SD: Standard deviation

Table 11. Differences in bullying according to sleep pattern of the study sample (n = 1089)

Category		Sum of Squares	df	Mean Square	F	P-value
Sleep	Between groups	136.769	1	136.769	1549.529	< 0.001
	Within groups	95.944	1087	0.088		
	Total	232.713	1088			

df: Degree of freedom

Out of 467 students reporting irregular meal consumption, 178 were found to be bullied. Furthermore, 52% of students who are bullied do not eat their meals regularly (25.80 ± 8.79; F = 20.56; P = 0.0001; Table 13).

Discussion

The present investigation addressed the issue of bullying in children afflicted with obesity, a prevalent health concern among this demographic. The study findings indicated that bullying is widespread among middle school students, affecting 40% of this population. Additionally, it was observed that 15-year-old students experienced a higher prevalence of bullying compared to their counterparts in other age groups. However, bullying is not related to the sex variable. In fact, no differences were observed between girls and boys. These findings were in accordance with previous studies in a number of countries, including Vietnam, where a survey conducted in 2017 revealed that 44.7% of students were bullied (Nguyen, Nakamura, Seino, & Vo, 2020).

Table 12. Description of eating habits according to bullying of the study sample (n = 1089)

Categories		Yes Bullying	No Bullying
		(n/%) /Mean ± SD	(n/%) /Mean ± SD
Eating while stressed	Yes	(293/26.90) 26.89 ± 9.39	(259/23.78) 27.01 ± 9.21
	No	(42/3.85) 31.53 ± 8.95	(492/45.17) 29.51 ± 10.05
Night eating	Yes	(297/27.27) 27.14 ± 9.49	(230/21.12) 26.73± 8.47
	No	(40/3.67) 29.62 ± 8.84	(522/47.93) 29.51 ± 10.27
Eating meals regularly	Yes	(156/14.32) 29.43 ± 9.83	(459/50.41) 29.02 ± 10.17
	No	(178/16.34) 25.80 ± 8.79	(289/26.53) 28.13 ± 9.85

SD: Standard deviation

Table 13. Differences in eating habits according to bullying of the study sample (n = 1089)

Categories		Sum of squares	df	Mean square	F	P-value
Night eating	Between groups	65.939	1	65.939	429.779	< 0.001
	Within groups	166.774	1087	0.153		
	Total	232.713	1088			
Eating while stressed	Between groups	55.489	1	55.489	341.426	< 0.001
	Within groups	176.173	1084	0.163		
	Total	231.662	1085			
Eating meals regularly	Between groups	4.315	1	4.315	20.567	< 0.001
	Within groups	226.583	1080	0.210		
	Total	230.898	1081			

df: Degree of freedom

Biswas et al. (2020) reported that bullying is prevalent among adolescents in the age group of 12 to 17 years (30.5%). In the same context, Alsaleem et al. (2021) reported that 64.7% of school students were exposed to bullying (in Khamis Mushait city, Saudi Arabia). In the present study, the overall rate of bullying was a 31% among intermediate school students in Ha'il city, Saudi Arabia. This discrepancy between studies in Saudi Arabia could be related to the different age groups and school stages studied. In fact, a significant relation was observed between BMI and bullying. In accordance with our results, Janssen, Craig, Boyce, and Pickett (2004) reported that overweight and obese school-aged children are more likely to be the victims and perpetrators of bullying behaviors than their normal-weight peers. In the same context, obese children are more prone than their peers to bullying, depression, anxiety, and stress (Juvonen & Graham, 2014; Ngo et al., 2021).

The results of the current study indicated that no significant differences were observed in bulling according to sex or educational level. However, a significant difference was observed according to the age variable, with a high level of bulling in the 15-year-old group. These findings are in line with those of other studies, which did not identify significant differences in involvement in bullying between genders (Silva, Pereira, Mendonca, Nunes, & de Oliveira, 2013; Povedano, Estevez, Martinez, & Maria, 2012). Accordingly, Garmy, Vilhjalmsson, and Kristjansdottir (2018) found that Icelandic students report being bullied at least 2-3 times per month, and the youngest are the most likely to be bullied.

The findings from the current study suggest that students who refrain from participating in sports activities are at a higher risk of experiencing bullying compared to their peers. This result is consistent with the findings of Ngantcha et al. (2018) who reported that students who spend more than two hours watching TV, playing video games, and on the computer suffer from decreased physical activity and increased rates of exposure to bullying**.** In the same context, Jimenez Barbero, Jimenez-Loaisa, Gonzelez-Cutre, Beltran-Carrillo, Llor-Zaragoza, and Jimenez Barbero et al (2019) indicated the positive effect of physical education on reducing the chances of exposure to school bullying. In addition, Herazo-Beltrán et al. (2019) conducted a cross-sectional study on 991 students between the ages of 7 and 17 in Colombia to determine the relationship between the level of physical activity and bullying. They found that students who either did not engage in physical activity or did so inconsistently were more susceptible to experiencing bullying within the school environment.

The findings suggested that students who experienced bullying tended to have insufficient sleep, sleeping for less than 7 hours. Accordingly, Donoghue and Meltzer (2018) reported that students who were exposed to bullying in physical, psychological, or cyber forms suffered from sleep disorders and had higher rates of insomnia. The literature dealing with bullying among French students in the age group from 10 to 18 years has proven that interrupted sleep and insomnia are a mediating factor in the relationship between aggression and external behaviors among bullies (Hysing, Askeland, La Greca, Solberg, Breivik, & Sivertsen, 2021; Kubiszewski, Fontaine, Potard, & Gimenes, 2014). The sleep disruption can be explained by the fears felt by the victims of bullying which contribute to their inability to fall asleep due to excessive thinking about what they may be exposed to tomorrow, which keeps them awake and unable to sleep or to feel satisfied with it (Astor, Benbenishty, Zeira, & Vinokur, 2002; Randa, Reyns, & Nobles, 2019). Moreover, exposure to bullying at school causes psychological distress to students,

and makes them sleep less than their peers of the same age (Sampasa-Kanyinga, Chaput, Hamilton, & Colman, 2018). The current results revealed that students undergoing bullying encounter challenges associated with their eating habits. They exhibit tendencies to consume food when experiencing stress, wake up at night to eat, and do not adhere to a regular meal schedule. In accordance with previous reports, students who have been exposed to bullying suffer from a high BMI (Brixval et al., 2012), which is often an inevitable result of eating disorders. It is noteworthy that adolescents with obesity eat whenever they feel stressed and do not have a regular feeding regime (Abedelmalek, Aloui, Denguezli, Adam, Souissi, & Chtourou, 2022b). Studies have indicated that those with eating disorders suffer from bullying, and are more likely to develop eating disorders than others (deLara, 2019). Results of several longitudinal studies have shown that being overweight, lack of acceptance of appearance, and poor self-esteem are associated with bullying (Kaltiala-Heino, Rimpela, Rantanen, & Rimpela, 2000; Lunde & Frisen, 2011; Lunde, Frisen, & Hwang, 2006). Bullying is also associated with eating disorders such as gluttony, difficulty controlling food intake, and eating unhealthy food. Moreover, it has been reported that girls who have been bullied suffer from these difficulties three times more often than boys (Lie, Ro, & Bang, 2019; Neumark-Sztainer, Falkner, Story, Perry, Hannan, & Mulert, 2002).

Thus, the stress of being teased and bullied contributes to the search for ways to overcome this stress and the perceived fears associated with the possibility of being bullied again. This can explain, in part, the excessive consumption of foods saturated with fats and fast food, and not following a regular diet that contribute to the exacerbation of health risks such as weight gain and increases bullying.

The strengths of this research project include the evaluation of demographic factors, sleep patterns, eating habits, and life activities and their association with bullying in schoolchildren and adolescents in different schools in Ha'il region, KSA. This study includes different types of bullying. However, the findings of this study have to be seen in light of some limitations. First, the study population is representative of schoolchildren in one region, so the results cannot be applied to all cities in Saudi Arabia. Second, the use of a single-item question regarding the prevalence of bullying may underestimate the phenomena. Another limitation is that the social level of the participants could be a factor that influences the data of the current study.

Conclusion

In the present study, a high prevalence of bullying related to obesity was observed in intermediate schools in the Ha'il region in Saudi Arabia. Therefore, mandatory serious efforts by educational staff (i.e., teachers), health care providers, and decision-makers in the region to deal with the problem are crucial.

Conflict of Interests

Authors have no conflict of interests.

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All official authorizations necessary to conduct this study were obtained. The study was approved by the research ethical committee of the University of Ha'il (RG-20 171).

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The Effectiveness of Cognitive-Behavioral Play Therapy on Impulsivity of Hyperactive 5-7-Year-Old Children

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Quantitative Study

Abstract

Background: The aim of the current research was to investigate the effectiveness of cognitive-behavioral play therapy on improving impulsivity of hyperactive children aged 5 to 7 years.

Methods: This study employed a quasi-experimental design with both pre- and post-tests, along with a control group, and a follow-up period of one month. The statistical population included all children with hyperactivity disorder, 5 to 7 years old, in Izeh City, Iran, in 2020. Purposeful sampling was employed to select 30 participants based on the inclusion and exclusion criteria. They were then randomly assigned to two experimental and control groups (n = 15 per group). The intervention group received twelve 60-minute sessions of cognitive-behavioral play therapy, while the control group was on the waiting list. The Barratt Impulsiveness Scale-Version 11 (BIS-11) was applied as a research tool. Repeated measures analysis of variance (ANOVA) was used by SPSS software.

Results: The univariate analysis of covariance (ANCOVA) showed that cognitive-behavioral play therapy effectively reduced impulsivity (F = 24.514, P = 0.001) and this difference continued during the follow-up period.

Conclusion: The effect of cognitive-behavioral play therapy training on the improvement of impulsivity in the experimental group in comparison with the control group has continued in the follow-up phase of 1.5 months.

Keywords: Cognitive-behavioral therapy; Play therapy; Impulsivity; Hyperactivity

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Introduction

Attention deficit/hyperactivity disorder (ADHD) is a neurobehavioral developmental disorder that is often diagnosed in childhood (Muskens, Velders, & Staal, 2017). In hyperactive children, impulsivity is one of the important variables that researchers pay attention to. Impulsive children often do not have proper control over their behavior and the reactions they show to the events around them are too natural (Valori, Della Longa, Angeli, Marfia, & Farroni, 2022). Impulsivity is defined as immediate action, lack of focus on the activity at hand, and lack of planning and thinking, and is part of a behavioral pattern and not a single action (Bakhshani, 2014). Impulsivity is a kind of psychological mechanism through which a person unconsciously shows the pressures caused by his deprivations in the form of risky reactions and when he is impulsive, he does not care about the rights and demands of others. Impulsivity helps a person in the immediate satisfaction of needs and desires and temporary solutions, but in the long term, aggression alienates people from others and makes them suspicious, fearful, hostile, and withdrawn (Herman, Critchley, & Duka, 2018).

Cognitive-behavioral play therapy is often used to treat maladjusted children and those who have difficulty solving adjustment issues (Ashori & Dallalzadeh Bidgoli, 2018). Play therapy is a method by which the child's natural means of expression, i.e., play, are used as a therapeutic method to help the child control his emotional pressures (Shrinivasa, Bukhari, Ragesh, & Hamza, 2018). Moreover, this method is used for three- to eight-year-old children who have family problems (such as parental divorce), nail biting, nocturnal enuresis, behavioral disorders, and hyperactivity, and are unsuccessful in group relationships or have become victims of child abuse (Birdal & Doğangün, 2016). Therapists who use play therapy believe that this method allows the child to build the world on a smaller scale with his hands and bring it under his influence; a task that is not possible in the environment around children every day (Elbeltagi, Al-Beltagi, Saeed, & Alhawamdeh, 2023). In cases where a child commits a destructive act in the playroom, the teacher's behavior is very important. Children in such conditions look at the teacher or therapist to find out his reaction (Rogers, 2015). Freud believed that if the child is playing in a safe environment, then the game gives the child an opportunity to express anxiety without being punished. In the meantime, like Freud, Erikson concludes that play can reduce anxiety (Capps, 2018). In addition, he believed that the game was used to form self-esteem by helping to develop social and physical skills (self-improvement function) (Alieksieieva, Bihun, Chukhrii, Honcharovska, Kalishchuk, & Otych, 2022).

Many studies have proven the effectiveness of this approach. For example, Karimi Lichahi, Azarian, and Akbari (2021) found that according to the results of the covariance analysis, play therapy had a significant positive impact on enhancing reading performance and adaptive skills, while also decreasing behavioral issues in the experimental group. It helps with dyslexia, which improves executive functions such as decision-making, organization, planning, self-management, and self-control. Hosseinzadeh (2021) showed that cognitive game therapy reduced the symptoms of attention deficit/hyperactivity and impulsivity, and this approach is suggested to therapists and psychological specialists. The findings of Zarandi, Ghodrati, & Vatankhah (2018) showed that there was a significant difference between the mean behavior problems, learning problems, psycho-physical problems, impulsivity, and passive anxiety of the experimental and control groups in the post-test stage. El-Nagger, Abo-Elmagd, & Ahmed (2018) found that cognitive behavioral play

therapy was influential on reducing the symptoms of attention deficit/hyperactivity and impulsivity in hyperactive children. Hirschfeld and Wittenborn (2016) confirmed that this approach was effective on impulsivity for young children whose parents were divorced. They found that cognitive behavioral play therapy had been effective in improving children's impulsivity. Stulmaker and Ray (2015) demonstrated that play therapy improved impulsivity in young, anxious children. In order to address impulsivity in hyperactive children, it is critical to undertake studies that aim to alleviate the challenges faced by these children. The chief inquiry of this research is whether the efficacy of cognitive-behavioral play therapy can be ascertained in ameliorating the impulsiveness of hyperactive children ranging from 5 to 7 years old.

Methods

This study employed a quasi-experimental design with both pre- and post-tests, along with a control group, and a follow-up period of one month. The statistical population included all children with hyperactivity disorder, 5 to 7 years old, in Izeh City, Iran, in 2020. Purposeful sampling was employed to select 30 participants based on the inclusion and exclusion criteria. They were then randomly assigned to two experimental and control groups (n = 15 per group). The adequacy of sample size was confirmed through G*Power software (α = 0.05 and power test = 0.90). The inclusion criteria were as follows: age between 5 to 7 years old, living with their parents, and having ADHD criteria based on Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-V), and exclusion criteria were their parents' or their reluctance to take part in the study, failure to maintain proper participation (over two absences in the therapeutic sessions), and unwillingness to continue participation.

After receiving the necessary permissions for conducting the research, the sample of research was selected. To select the sample, 30 children with hyperactivity disorder aged 5 to 7 years from Niayesh Primary School in Izeh City, who were selected purposefully, were randomly divided into two experimental and control groups. Mothers of children with hyperactivity disorder were invited before the implementation of the intervention, and the necessary explanations about the play therapy intervention and how to correctly fill out the questionnaire were presented to them by the therapist. The Barratt Impulsiveness Scale-Version 11 (BIS-11) for children with hyperactivity disorder was administered to both groups (intervention and control) before conducting the training sessions. The intervention group received twelve 60-minute sessions of cognitive-behavioral play therapy (Knell, 1993), while the control group was on the waiting list. The intervention program was implemented by the first author who had passed specialized workshops and courses in the school counseling office. The follow-up period was conducted using the research instruments on the intervention and control groups one month after the post-test. Table 1 shows a summary of the cognitive-behavioral play therapy. During the experiment, the therapist played the desired game with each child individually for 7 minutes while the other children were playing, and at the end of each session, all the children played the game together in turns. After the implementation of the intervention to conduct the post-test, the questionnaires were completed again by mothers of children with hyperactivity disorder. The follow-up test was held for both the test and control groups one month after the completion of the sessions and taking the post-test.

BIS-11: This scale has been designed by Barratt (Patton, Stanford, & Barratt, 1995).

The BIS-11 is a 30-item self-report measure that assesses impulsivity using a 4-point Likert scale (1 = rarely/never and 4 = almost always/always). Higher scores indicate higher levels of impulsivity. The lowest and highest scores are 30 and 120, respectively**.** Reliability coefficients were calculated using Cronbach's alpha and retest methods, which were 0.81 and 0.77, respectively. The results provide evidence that the structure of the BIS-11 scale applies to the Iranian sample (Javid, Mohammadi, & Rahimi, 2012). In the present study, the reliability of this questionnaire was obtained using Cronbach's alpha method (0.82).

Repeated measures analysis of variance (ANOVA) was used to examine the effectiveness of cognitive-behavioral play therapy in improving impulsivity in hyperactive children. Before analysis, the data were examined to ensure meeting the basic assumptions of repeated measures ANOVA. In this regard, the normal distribution of scores and homogeneity of variance and covariance matrices (homoscedasticity) were examined, confirming the assumption of normal distribution of hyperactive children with impulsivity scores in both study groups. Mauchly's sphericity test was also used to check if the assumption of homoscedasticity was met. Levene's and Box's M tests were used to validate the assumption of equivalence of covariance and hyperactive children with impulsivity variances. The results confirmed the homogeneity of variances. Mauchly's test also verified the assumption of sphericity. Ultimately, the Box's M test indicated the equivalence of covariance in the intervention and control groups. Therefore, the assumptions for conducting repeated measures ANOVA were met. Data analysis of this research was done on two descriptive and inferential levels with SPSS software (version 26, IBM Corporation, Armonk, NY, USA).

Table 1. A summary of the cognitive-behavioral play therapy sessions

Sessions	Contents
1	Introduction of the consultant: getting to know the students and explaining the general structure of the sessions
2	Objectives: 1) reviewing the homework and receiving the homework from the subjects, 2) introducing the game and how to do it and the purpose of doing it
3	Objectives: 1) reviewing the assignments of the previous session, 2) introducing the game to the subjects and the purpose of playing the game
4	Objectives: 1) reviewing the assignments of the previous session, 2) introducing the game to the subjects and the purpose of playing the game
5	Objectives: 1) reviewing the assignment of the previous session, 2) introducing the play dough to the subjects and the purpose of playing the game; after the greeting, the subjects were asked to review the assignment related to the previous session and then the new training game was given.
6	Objectives: 1) reviewing the assignment of the previous session, 2) introducing the fight game but with your paper to the subjects and the purpose of playing the game
7	Objectives: 1) reviewing the assignment of the previous session, 2) introducing the reminiscence game to the subjects and the purpose of playing the game
8	Objectives: 1) subjects' assignment, 2) introducing the games and the purpose of playing them; after the greeting, the subjects were asked to review the assignment related to the previous session.
9	Objectives: 1) reviewing the homework of the subjects, 2) introducing the games and the purpose of playing them
10	From the tenth session to the twelfth session, no new game was taught, only the games of the previous sessions were reviewed, and with the help of the subjects, and at the end of the twelfth session, while thanking the subject for his cooperation as well as the control group, the post-test was conducted separately.

Results

In this study, in the experimental group, 53.33% of female children and 46.66% of male children, and in the control group, 73.33% of female children and 26.66% of male children made up the sample. Besides, 60% were related to parents of two children in the experimental group and 53.33% were related to parents of two children in the control group; 13.33% related to parents of one child in the experimental group and 20% related to parents of three children in the control group had the lowest frequency. In the experimental group, the highest value was 60% related to the father's bachelor's education, and in the control group, 73.33% were related to the father's bachelor's education. In the experimental group, the father's diploma education had the highest value at 66.6%, while in the control group, the lowest value was related to the father's master's education at the same percentage. In addition, in the experimental group, the highest value was 46.66% related to the mother's bachelor's education, and in the control group, 53.33% related to the mother's bachelor's education. The smallest percentage observed in the experimental group was 33.13% for mothers with associate degrees, while in the control group, the lowest percentage was also 33.13% for mothers with diplomas.

According to table 2, the estimated mean scores of the impulsivity from the pretest, posttest, and follow-up stages were significantly different.

The univariate analysis of covariance (ANCOVA) showed that cognitive-behavioral play therapy effectively reduced impulsivity ($F = 24.514$, $P = 0.001$) (Table 3).

Table 4 shows that the ANOVA was significant for the within-group and between-group variables ($P < 0.001$). This revealed that the effect of time alone was significant considering the group effect. Moreover, the interaction effects of group and time were significant ($P < 0.001$). The results of repeated measures ANOVA indicated the effectiveness of cognitive-behavioral play therapy in improved impulsivity of the hyperactive children. Considering the significant factors at the within-group level, the significant difference in three measurement stages (pretest, posttest, follow-up) was confirmed for student impulsivity. Furthermore, the significant group source illustrated a significant difference in hyperactive children impulsivity between the cognitive-behavioral play therapy and control groups.

Discussion

The present study aimed to assess the effectiveness of cognitive-behavioral play therapy on improving the impulsivity of hyperactive children aged 5 to 7 years from Niayesh Pre-school in Izeh City. The results showed that cognitive-behavioral play therapy training reduced impulsivity in hyperactive children. These results have continued into the 1.5-month follow-up phase.

Table 2. Mean and standard deviation (SD) of the impulsivity in intervention and control groups

Variable	Phase	Intervention group (mean ± SD)	Control group (mean ± SD)	K-S	P-value
Impulsivity	Pretest	87.40 ± 6.74	86.40 ± 7.83	0.070	0.041
	Posttest	87.00 ± 6.55	78.67 ± 8.27	0.050	0.001
	Follow-up	87.53 ± 7.47	78.93 ± 8.35	0.165	0.021

SD: Standard deviation; K-S: Kolmogorov-Smirnov

Table 3. The results of univariate covariance on impulsivity

	SS	MS	F	P-value	η^2
Fixed effect	1032.820	1471.890	24.514	0.001	0.302
Pre-test	1147.210	1153.280	19.414	0.001	0.318
Groups	31652.142	21573.114	543.532	0.001	0.531
Error	1172.330	34.760			
Total	31612.946				

SS: Sum of squares; MS: Mean square

Based on the confirmation of the effectiveness of cognitive-behavioral play therapy training in reducing impulsivity in hyperactive children, it can be said that it has reduced impulsivity in the experimental group compared to the control group.

This finding is consistent with the research results of previous studies (Karimi & Ganji, 2021; Hosseinzadeh, 2021; Watankhah et al., 2018; Al-Nijer et al., 2018; Hirschfeld & Wittenborn, 2016; Feizollahi, Sadeghi, & Rezaei, 2020).

Javanbakhsh and Shahidi (2021) showed that play therapy based on cognitive-behavioral therapy had an effect on the rate of hyperactivity as well as children's behavior in the classroom, group participation and cooperation, and attitudes toward power authorities in primary school and it improved children's performance (Javanbakhsh & Shahidi, 2021). Moreover, Ghodousi et al. (2017) revealed that an effective way to lessen externalizing behavior problems such as aggression and law-breaking behavior among street and working children was cognitive-behavioral play therapy (Ghodousi, Sajedi, Mirzaie, & Rezasoltani, 2017). In the other study, findings showed that play therapy based on the cognitive-behavioral model could reduce behavioral problems and improve the social skills of children with ADHD (Ashori & Dallalzadeh Bidgoli, 2018).

Nayebi et al. (2020) showed that both individual and group play therapy were effective in increasing the component of problem coping and decreasing the component of solution aversion and destructive coping in primary students with ADHD (Nayebi, Pasha, Bakhtiyarpour, & Eftekhar Saadi, 2020). Additionally, based on the findings of follow-up test, group play therapy was more effective than individual play therapy in terms of increasing the component of problem coping and decreasing the components of solution aversion and destructive coping in primary school students with ADHD.

The theories that explain children's play are very different in terms of the type of explanation, for example, they consider play as a component of cognitive and rational development, and a means for new skills. However, none of these theories have a contradiction in using games as a therapeutic method. Play is one of the essential components of children's lives, because they are usually in the most natural and comfortable state while playing, and as easily as adults express their feelings through speech, they do the same through play (Karimi & Ganji, 2021; Hosseinzadeh, 2021; Feizollahi et al., 2020). This therapeutic method is short-term, directive, and problem-focused. In cognitive-behavioral play therapy, the therapeutic relationship established between the counselor and the client is an informative and cooperative relationship for understanding.

Table 4. Repeated measurement results for the effects of time and interaction of time and group

Variables	Source	SS	MS	F	P-value	η^2
Impulsivity	Time	84.92	42.63	27.37	0.001	0.65
	Group	286.89	143.44	46.68	0.001	0.73
	Time × group	7.20	7.20	5.22	0.030	0.25

SS: Sum of squares; MS: Mean square

Game techniques as well as verbal and non-verbal communication are used to help children change their behavior and participate in treatment; thus, it can be said that the game is an extremely efficient and effective tool that can be used to enter the inner world of children. Therefore, the results obtained, which indicate a significant relationship between cognitive-behavioral play therapy training and the reduction of impulsivity in hyperactive children, are completely understandable (Ashori & Dallalzadeh Bidgoli, 2018; Nayebi et al., 2020).

The current research was not free of problems and obstacles in its implementation; among these limitations we can mention that the results are exclusive to children with hyperactivity disorder, 5 to 7 years old at Niayesh Primary School in Izeh City. Caution is needed in generalizing the study findings to other groups of samples. Because of self-report tool, the information obtained from this tool may not be a completely accurate description of the reality. It is possible that the conditions of the test affected the test subjects because of answering many questions of the questionnaire (pretest-posttest), and as a result, their accuracy in answering may have decreased.

Conclusion

According to the confirmation of the effectiveness of cognitive-behavioral play therapy training in reducing impulsivity in hyperactive children, it can be said that it has reduced impulsivity in the experimental group compared to the control group. Play therapy is a helpful interaction between a child and a trained adult, which seeks ways to establish communication and reduce the child's emotional disturbances through symbolic communication in the game so that during interpersonal interactions with the therapist, the child experiences acceptance, emotional discharge, reduction of painful effects, reorientation of impulses, and corrected emotional experience.

Conflict of Interests

Authors have no conflict of interests.

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The Effectiveness of Solution-Focused Brief Therapy on Emotional Regulation, Quality of Life, Pain Perception, and Hostile Attributions in Patients with Cardiovascular Diseases

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Quantitative Study

Abstract

Background: Today, with the increasing trend of urbanization and industrialization of societies, physical and mental diseases are increasing. The present study aimed to determine the effectiveness of Solution-Focused Brief Therapy (SFBT) on emotion regulation, quality of life (QOL), pain perception, and hostile documents in patients with cardiovascular diseases.

Methods: This research was a semi-experimental study with a pretest-posttest design, a control group, and a 2-month follow-up period. The statistical population comprised patients with cardiovascular disease at Tehran Heart Hospital, Iran, in 2023. The statistical sample, consisting of 30 individuals, was purposefully selected. Subsequently, 15 individuals were randomly assigned to the control group and another 15 to the experimental group. The intervention group underwent SFBT, comprising 8 sessions of 90 minutes each, conducted once a week. Data were collected and analyzed using the Affective Control Scale (ACS; Williams et al., 1997), the World Health Organization Quality of Life Questionnaire (WHOQOL-BREF), the McGill Pain Questionnaire (MPQ; Melzack, 1975), and the Hostile Documents Questionnaire (Arnetz et al., 2003). The variance was analyzed.

Results: The results showed that with controlling the pretest, there was a significant difference between the scores of the control and experimental groups in terms of emotion regulation ($P < 0.001$; $F = 40.716$), QOL ($P < 0.001$; $F = 110.980$), pain perception ($P < 0.001$; $F = 159.959$), and hostile documents ($P < 0.001$; $F = 168.955$).

Conclusion: These findings indicate that SFBT plays an important role in controlling heart patients' emotions and QOL, so these findings can be used to formulate preventive and even treatment programs for heart patients.

Keywords: Emotional regulation; Pain perception; Hostile documents; Solution-focused therapy; Quality of life

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Introduction

Today, changes in lifestyle and the cultural and social structure have led to increased cardiovascular diseases in society (Shataban, Mirmehdi, & Shataban, 2023). Cardiovascular disease, as a chronic condition, often begins with risk factors such as obesity, type 2 diabetes, and high blood pressure, which irreversibly damage the vascular structure and ultimately lead to adverse clinical outcomes such as arterial thrombosis and ischemic stroke. While genetics can be blamed for less than 20% of occurrences, dietary habits and nutrition have more profound and lasting effects. This disease is one of the most dangerous global health issues, causing a significant number of deaths each year and impacting 17.9 million people worldwide. The prevalence of cardiovascular disease is a considerable concern due to the difficulty in diagnosis (Kumar et al., 2022). Cardiovascular and cerebrovascular diseases are the leading cause of death and disability in Iran, with cardiac surgeries accounting for about 60% of all surgeries performed in the country (Pourqana, Amirinejad, Razavi Toosi, & Seyed Mohammad Taghi, 2021). Cardiovascular and cerebrovascular diseases affect various psychological aspects, including emotional regulation, quality of life (QOL), and pain perception.

One of the factors that play a crucial role in the lives of individuals with cardiovascular diseases is their ability to control emotions. Emotion regulation is the capacity to understand emotions and feelings, regulate emotional experiences, and express emotions. It is not merely the suppression of emotions, but rather the lack of a constant static state of arousal. Emotion regulation involves changing emotional experiences (Yuan et al., 2023). Emotion regulation consists of the four dimensions of anger, depressive mood, anxiety, and positive emotion. It is necessary for adapting to stressful life events (Raesi & Kashkoli, 2016).

The relationship between the QOL and the health of cardiac patients is significant. The concept of QOL encompasses potential abilities (functional status), access to resources and opportunities for using skills to pursue and engage in interests (objective QOL), and an overall sense of well-being (mental QOL) (Sella et al., 2023). Today, QOL has become one of the fundamental and essential issues in human societies, encompassing all dimensions of life, including health.

Chronic pain affects various aspects of an individual's life, including emotional, occupational, and physical functioning, imposing substantial costs on society and the healthcare system (Kelting et al., 2019). The perceptual experience of pain involves psychological processes such as attention, interpretation, coping strategies, and pain-related behaviors, starting from the moment sensory stimuli from the pain receptor system are transmitted to the central nervous system. These psychological processes are influenced by previous learning, cognitions, emotions, environmental factors, positive and negative outcomes, culture, and family, which lead to different pain processing and behaviors (Lopes & de Lima Osório, 2023).

Another influential factor on cardiovascular patients is hostile attribution bias. Researchers like Nisanci and Nisanci (2023) have defined negative attributions as significant reactions to betrayal in individuals who perceive betrayal. These attributions tend toward hostility toward others' behaviors (Zajenkowska et al., 2021), thus resulting in aggression and marital conflicts (Abreu-Afonso et al., 2022). Individuals with hostile attribution bias tend to think negatively about the causes of angry events in daily life. They engage in repetitive cognitive rumination, even after the event has ended, processing the causes of events in a hostile manner (Wang et al., 2019).

One of the suitable treatments for cardiovascular patients is Solution-Focused

Brief Therapy (SFBT). SFBT is one of the final therapies initiated at the Family Therapy Center in Milwaukee by Visconsi et al. They aimed to streamline the problem-solving stage in therapy sessions and enhance the solution-focused approach (Sperry & Sperry 2023). The goal of SFBT is mutual collaboration between clients and therapists in creating solutions, focusing on clients' goals, highlighting exceptions, miracle questions, coping questions, scaling questions, and identifying clients' strengths and resources as essential elements of this approach (Leslie, 2022).

Instead of focusing on deficiencies and weaknesses, SFBT prioritizes clients' strengths, resources, and capabilities (Ayar & Sabancioğullari, 2022). The effectiveness of SFBT on pain perception was examined, indicating that SFBT influences pain perception. Additionally, the results of studies by Ayar and Sabancioğullari (2022) and Stanely et al. (2019)) demonstrate the effectiveness of SFBT in reducing pain perception and increasing emotion regulation.

SFBT's effectiveness on some variables related to cardiovascular diseases has also been investigated. However, a search in the research literature did not lead us to a study regarding the efficacy of this therapeutic approach in controlling emotions and hostile attributions in these patients. Therefore, understanding the qualitative effectiveness of this approach holds significant implications for the application of therapeutic interventions in reducing psychosocial damages resulting from cardiovascular diseases and can be of considerable importance. Thus, the current research aimed to determine the effectiveness of SFBT on emotion regulation, QOL, pain perception, and hostile attribution bias in cardiovascular patients.

Methods

Study design and participants: The present study was conducted with a semi-experimental design, a pretest-posttest design, and a two-month follow-up. The statistical population of this research included patients referred to the specialized heart hospital in Tehran, Iran, from March to May 2022, diagnosed with heart failure by a cardiovascular specialist. The sample consisted of 30 individuals, randomly assigned to two groups of 15, the experimental and control groups. Subsequently, the experimental group received SFBT in 8 sessions of 90 minutes each, while the control group did not receive any intervention. After obtaining written and verbal consent from the participants, questionnaires were provided to them at the beginning of the research (pretest phase) and were completed.

The inclusion criteria for participation in the study included a diagnosis of cardiovascular disease by a cardiovascular specialist, willingness and informed consent to participate in the research, the ability to attend sessions, and cooperation in performing tasks. The criteria for exclusion from the study included the presence of other psychological or physical illnesses (such as cancer or gastrointestinal disorders) and severe and acute symptoms of heart disease that would make participation difficult or impossible. For the statistical analysis of the data at the inferential level, a multivariate analysis of covariance (MANCOVA) was used in SPSS software (version 26; IBM Corp., Armonk, NY, USA).

Instruments and variable

The Affective Control Scale: The Affective Control Scale (ACS) is a 42-item questionnaire developed by Williams et al. in 1997. It comprises the four dimensions of anger, depressed mood, anxiety, and positive emotion. Each question in each dimension is scored on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). The test-retest reliability after four weeks for the anger dimension

is 0.73 and 0.72, for the depressed mood dimension is 0.76 and 0.91, for the anxiety dimension is 0.77 and 0.89, and for the positive emotion dimension is 0.66 and 0.84.

Convergent validity with the Positive and Negative Affect Schedule (PANAS) by Watson et al. (1988) shows an r = 0.36, and divergent validity with the negative emotion subscale of the PANAS is r = 0.58, as reported by Williams et al. (1997).

The reliability of the ACS was assessed in the study by Besharat et al. (2014), revealing Cronbach's alpha values of 0.53 for the anger dimension, 0.84 for the depressed mood dimension, 0.64 for the anxiety dimension, and 0.60 for the positive emotion dimension, indicating the scale's appropriateness. Tahmasebian et al. (2014) calculated the validity of this questionnaire in their research through correlational analysis, with results showing desirable validity for anger and emotion regulation (r = 0.765), depressed mood and emotion regulation (r = 0.751), anxiety and emotion regulation (r = 0.841), and positive emotion and emotion regulation (r = 0.844).

The World Health Organization Quality of Life Questionnaire: This World Health Organization Quality of Life Questionnaire (WHOQOL-BREF), developed by the World Health Organization (WHO), consists of 26 questions designed to measure the overall and general QOL of an individual. The questionnaire comprises four domains: physical health, psychological health, social relationships, and environment, along with an overall score. Each of the 26 questions is rated on a scale ranging from 1 to 5, with questions 3, 4, and 26 being reverse scored. The physical health subscale includes 7 questions, the psychological health subscale comprises 6 questions, and the social relationships and environment subscales consist of 3 and 8 questions, respectively. Additionally, 2 questions are related to overall QOL and general health.

Initially, a raw score is calculated for each subscale, and then, transformed into a standardized score ranging from 0 to 100. Scores between 0 and 30 indicate an unfavorable QOL, scores between 30 and 70 represent a moderate QOL, and scores from 70 to 100 indicate a high and desirable QOL. This questionnaire has been validated by the WHO Quality of Life Group in various countries, and its validity and reliability in Iran have been confirmed by Ghaffari et al. (2018).

McGill Pain Questionnaire: The McGill Pain Questionnaire (MPQ), developed by Melzack (1975), consists of 20 sets of phrases and aims to assess individuals' perception of pain from various dimensions, including the sensory perception of pain, emotional perception of pain, and evaluative perception of pain, covering diverse and varied types of pain. The cutoff point for this questionnaire is a score of 70. In the research by Dworkin (2009), the validity of this questionnaire has been confirmed. In Iran, the content validity of the MPQ was examined and approved in the study conducted by Moazzen et al. (2012). After translation and revision by language experts, 5 faculty members of Mashhad University of Medical Sciences, Iran, reviewed and validated the questionnaire. The reliability of the questionnaire was also calculated using Cronbach's alpha, resulting in alpha coefficients ranging from 0.83 to 0.87 for all dimensions.

Solution-Focused Brief Therapy

The solution-oriented SFBT sessions were taken from the book Key Concepts in Solution-Oriented Therapy by Deshazi (1985), quoted by Ekaqi et al. (2019). This approach consisted of 8 sessions, 90-minute sessions once a week. The content of the sessions is presented in table 1.

Analysis: MANCOVA was used in SPSS software to analyze statistical information at the inferential statistics level.

Table 1. Short-term psychotherapy sessions of Deschazer's circuit solution (1985)

Session	Description
First	On the group's initial meeting, the members were introduced and the rules were discussed. Then, a problem was transformed into a word and presented with attainable goals. Then, a discussion and debate on the solutions and assignments were presented for the next session.
Second	Last week's assignments were reviewed in the second session, and individual goals were set. Complaint solutions were discussed, and problem-solving circles were formulated. The participants were asked to write down the goals of participating in the counseling sessions for their homework and present them on the next session.
Third	The previous meeting presented a summary of the last meeting, and the group's current problems were discussed. A discussion about the future and the use of the technique of exceptions and miraculous questions was conducted. Next, the emphasis was on finding positive stories about the participants' problems. The assignment for the next week was for the participants to think about when they had fewer or no behavioral problems.
Fourth	On the fourth session, the conclusions from the previous session were presented, and the assigned assignments were reviewed. Explanations of master essential techniques and scaled questions were provided, and group members were asked to apply these techniques to their problems. to take
Fifth	On the fifth session, the previous week's assignments were reviewed, and then, pretend techniques, solution-oriented questions, Khalaf argument, and betting were discussed. For the task, the group members were asked to think about being different from the current behaviors and present their answers to the group on the next meeting.
Sixth	On the sixth session, the entire treatment program was reviewed, the group members' questions were answered, and the group members' reached treatment goals were discussed. For the task, the group members were asked to think about consolidating and consolidating changes for the next meeting and presenting them to the group.
Seventh	On the seventh session, the participants were helped to review sessions and what they changed. Counselors had to show these changes and encourage them to take action. In an assignment, the members were asked to report on their achievements and what they had learned from the group meetings by the next week. Applying it in thought life and bringing it to the discussions in written form.
Eighth	In this meeting, the group members, with the consultant's help, summarized the previous conferences and celebrated their success at the end. The success of each person in the group was reviewed, and the posttest was conducted.

Results

The mean age of the subjects in the control and experimental group was 28.33 ± 5.80 years and 28.73 ± 6.41 years, respectively.

As can be seen in table 2, the posttest and follow-up scores of the experimental group in the variables of emotion regulation, QOL, and perception in two hostile documents have improved in comparison to the pretest. However, the trend of the average scores of the control group has been almost constant, which somehow shows that the treatment is effective. Of course, to measure the significance of these differences, statistical tests should be used. For this purpose, the analysis of covariance (ANCOVA) was used after checking the assumption of normality, homogeneity of variances, and homogeneity of the covariance matrix.

Before running ANCOVA, its presuppositions were checked. Lune's test was used to check the homogeneity of variances. According to the table, the results of Lune's test showed the error of variances in the variables of emotion regulation (P = 0.271; F = 0.260), QOL (P = 0.472; F = 0.531), pain perception (F = 0.324; P, F=1.006) and hostile documents (P = 0.231; F = 1.356) are similar (P < 0.05), so the groups can be compared with each other. The results of the Box's M test to check the homogeneity of variance-covariance were not statistically significant, and this meant establishing the assumption of homogeneity of the covariance matrix (P = 0.068; F = 1.961; Box's M = 13.328).

Table 2. Descriptive statistics of SAPS, CAT, and DASS-21 questionnaires (Part I)

Variable	Intervention group		
	Pretest	Posttest	Follow-up
	Mean ± SD		
Emotion regulation	105.86 ± 29.83	126.86 ± 21.40	122.46 ± 19.26
Quality of life	70.33 ± 6.59	95.33 ± 5.30	89.35 ± 6.58
Pain perception	122.66 ± 10.58	93 ± 6.30	95.86 ± 4.72
Hostile documents	70.33 ± 6.95	52.33 ± 3.30	56.30 ± 5.13

Table 2. Descriptive statistics of SAPS, CAT, and DASS-21 questionnaires (Part II)

Variable	Control group		
	Pretest	Posttest	Follow-up
	Mean ± SD		
Emotion regulation	104.73 ± 31.33	104.2 ± 25.59	105.32 ± 32.54
Quality of life	70.1373 ± 7.03	69.46 ± 06.45	68.65 ± 8.76
Pain perception	123.5373 ± 10.91	122.53 ± 11.30	120.89 ± 13.76
Hostile documents	70.1373 ± 7.03	69.46 ± 6.45	70.93 ± 7.33

SD: Standard deviation

The results of Vickers' lambda showed that by controlling the effects of pretest scores, there is a significant difference between the two experimental and control groups in at least one of the variables ($P < 0.05$). Our general hypothesis was confirmed; the intervention was generally effective on dependent variables. The following results of ANCOVA are presented to check the dependent variables.

According to table 3, the results of ANCOVA showed that after controlling the effects of pretest scores, there was a significant difference between the scores of the two control and experimental groups in terms of emotion regulation ($P < 0.001$; $F = 40.716$), QOL ($P < 0.001$; $F = 110.980$), pain perception ($P < 0.001$; $F = 159.959$), and hostile documents ($P < 0.001$; $F = 168.955$). In other words, SFBT has been effective in controlling emotions, QOL, pain perception, and hostile documents in cardiovascular patients. In the continuation of examining the observed differences in the main effect of time (three stages of implementation), the Bonferroni post hoc test was used (Table 4).

Table 4 shows that the QOL scores have generally increased from the pretest to posttest and follow-up, indicating the effect of SFBT. In the QOL variable, the difference between the pretest and posttest stages ($P < 0.05$; $d = -7.91$) and the follow-up pretest ($P < 0.05$; $d = -5.74$) is significant. As can be seen in table 5, in general, the scores of emotional regulation, pain perception, and hostile documents have decreased from the pretest to the posttest and follow-up, respectively, which indicates the effect of psychotherapy.

Table 3. The result of the analysis of covariance for research variables

Variable	Source of variations	Sum of squares	df	Mean of squares	F	P	Eta
Emotion regulation	Pretest	12926.471	1	12926.471	131.225	0.001	0.191
	Group	4010.726	1	4010.726	40.716	0.001	0.528
	Error	2659.662	27	98.506			
Quality of life	Pretest	220.952	1	220.952	11.568	0.001	0.598
	Group	2119.770	1	2119.770	110/980	0.001	0.628
	Error	515.714	27	19.770			
Pain perception	Pretest	1219.813	1	1219.813	29.252	0.001	0.441
	Group	6670.402	1	6670.402	159.959	0.001	0.614
	Error	1125/921	27	41/701			
Hostile documents	Pretest	1229.813	1	1310.813	31.252	0.001	0.191
	Group	6680.400	1	6850.402	168.955	0.001	0.528
	Error	1124.921	27	38.701			

df: Degree of freedom

Table 4. Bonferroni's test to compare variables in three stages

Variable	Stage I	Stage J	P-value	Average difference (I-J)
Emotion regulation	Pretest	Posttest	0.001	-8.01
		Follow-up	0.001	-12.4
Quality of Life	Pretest	Posttest	0.001	-7.91
		Follow-up	0.001	-4.74
Pain perception	Pretest	Posttest	0.001	-6.90
		Follow-up	0.001	-4.70
Hostile documents	Pretest	Posttest	0.001	-3.60
		Follow-up	0.001	-10.70

As can be seen, in the emotion regulation variable, the difference between the pretest and posttest ($P > 0.05$; $d = -8.01$) and pretest and follow-up ($P < 0.05$; $d = -12.4$) is significant, and in the pain perception variable ($P > 0.05$; $d = -6.90$), the difference between the pretest and follow-up ($P > 0.05$; $d = -4.70$) is significant. Moreover, the difference between the pretest and posttest ($P > 0.05$; $d = -3.60$) and pretest and follow-up ($P < 0.05$; $d = -10.70$) in the variable of hostile documents is significant.

Discussion

The present study investigated the effectiveness of SFBT on emotion regulation, QOL, pain perception, and adversarial documents in patients with cardiovascular diseases. The results demonstrated that SFBT is effective in enhancing emotion regulation, improving QOL, altering pain perception, and mitigating adversarial documents. These findings are in line with the results of previous research by scholars such as Ayar and Sabancioğullari (2022), Stanely et al. (2019), Kesik et al. (2022), and Golbadi et al. (2021).

In interpreting the current research results, it can be stated that the effectiveness of SFBT on emotion regulation had a significantly positive impact, reshaping abnormal emotions by creating new meanings. Managing and controlling emotions makes individuals realistic, optimistic, and righteous, contributing to becoming valuable and efficient in societal progress. The more individuals experience conflicts, the more they liberate themselves from the suppression mechanism and feel greater vitality, creativity, self-discovery, and energy. The therapeutic intervention made individuals aware of their emotions, how emotions affect cognition and behavior, and the impact of emotions on decision-making. This awareness enabled participants to recognize the destructive effects of emotions on behavior and achieve positive emotion regulation by substituting balanced solutions for inappropriate ones (Stanely et al., 2019).

Moreover, SFBT significantly improved their QOL. Patients who have experienced adverse events in life, but focused on positive aspects report higher life satisfaction. Therefore, controlling and regulating emotions, meaning reducing depression and increasing positive mood and appropriate coping with the disease, can play an influential role in improving hope and mental health and, ultimately, the QOL in heart patients. Thus, positive emotions and feelings are essential to effective coping strategies, enhancing happiness, life satisfaction, and overall QOL for cardiac patients (Kesik et al., 2022).

The effectiveness of SFBT on pain perception and adversarial documents had a significant negative impact. By addressing patients' problems using techniques such as flooding, cognitive restructuring, cognitive distortions, mutual cognitive conversation, and improving relationships, this approach facilitates the resolution of negative cognitive patterns and introduces patients to valuable solutions. By reframing inappropriate solutions when faced with anger, anxiety, and confusion,

patients' capabilities in solution-oriented coping are enhanced (Ayar & Sabancioğullari, 2022). In essence, teaching specific interpersonal skills and social relationship patterns, along with providing basic concepts of communication and caring for patients with cardiovascular diseases, helps patients confront anxiety-provoking situations and reduces pain. This approach creates a pleasant and enjoyable experience accompanied by vitality and hope for life in cardiac patients (Gilbody et al., 2022).

Conclusion

The present study findings are in line with that of previous research, and demonstrated the effectiveness of SFBT on emotion regulation, QOL, pain perception, and adversarial documents in cardiovascular patients. However, it is essential to note some limitations of the current research, such as the purposive sampling method and a small sample size. Therefore, it is recommended that generalizability be enhanced in future studies by employing random sampling methods and larger sample sizes. It is suggested that future research investigates larger sample sizes in other regions of the country to improve the robustness of the findings.

Conflict of Interests

Authors have no conflict of interests.

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