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The Effect of a Mindfulness-Based Stress Reduction Program on Professional Quality of Life and Perceived Stress Level of the Pediatric Oncology-Hematology Nurses: Quasi-Experimental Study

Farkındalık Temelli Stres Azaltma Programının Pediatrik Onkoloji-Hematoloji Hemşirelerinin Mesleki Yaşam Kalitesi ve Algılanan Stres Düzeyleri Üzerine Etkisi: Yarı Deneysel Çalışma

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This study was presented as an oral presentation at EONS 15 during the ESMO 2022 conference, September 9-13, 2022, Paris, France.

ABSTRACT Objective: Pediatric oncology-hematology nurses are at risk for compassion fatigue, burnout, and stress. The research is lacking in information about the best ways for pediatric oncology-hematology nurses to handle stressful or challenging circumstances, and there is also limited information on the impact of mindfulness on these nurses' practice. This study investigated the effect of Mindfulness-Based Stress Reduction on pediatric oncology-hematology nurses' perceived stress and professional quality of life. **Material and Methods:** A quasi-experimental study was conducted with pediatric oncology-hematology nurses between November 2021-June 2022. Mindfulness-Based Stress Reduction program was applied to the nurses in sessions weekly 60-90 minute sessions for 8 weeks. Data was collected by the "Nurse Information Form", the "Professional Quality of Life Scale-IV", and the "Perceived Stress Scale". The data were analyzed using Wilcoxon signed-rank test. Cohen's d was used to calculate the effect sizes for the paired samples t-tests. **Results:** After the Mindfulness-Based Stress Reduction program, the nurses' mean scores of compassion fatigue and burnout, which are subdimensions of professional quality of life, decreased statistically significantly ($p<0.05$), while no statistically significant difference was found between the mean scores of compassion satisfaction and stress level of nurses pre- and post-intervention ($p>0.05$). **Conclusion:** Healthcare organizations should consider strategies to support nurses to care for themselves at the same priority level as caring for others. It is recommended that the Mindfulness-Based Stress Reduction program should be disseminated, and future studies should be conducted in different groups. Follow up nurses in terms of stress, burnout and compassion fatigue and implementation of preventive training programs are highly recommended.

Keywords: Burnout; compassion fatigue; mindfulness-based stress reduction; oncology nursing; pediatric

ÖZET Amaç: Pediatrik onkoloji-hematoloji hemşireleri, merhamet yorgunluğu, tükenmişlik ve stres açısından risk altındadırlar. Pediatrik onkoloji-hematoloji hemşirelerinin, stresli veya zorlu durumlarla başa çıkmalarının en iyi yolları hakkında bilgi eksikliği olduğu ve farkındalık uygulamalarının bu hemşirelerin üzerindeki etkisi hakkında da sınırlı bilgi olduğu bilinmektedir. Bu çalışmada, Farkındalık Temelli Stres Azaltma programının pediatrik onkoloji-hematoloji hemşirelerinin algıladıkları stres ve mesleki yaşam kalitesi üzerindeki etkisi araştırılmıştır. **Gereç ve Yöntemler:** Kasım 2021-Haziran 2022 tarihleri arasında pediatrik onkoloji-hematoloji hemşireleri ile yarı deneysel bir çalışma yürütülmüştür. Hemşirelere 8 hafta boyunca haftalık 60-90 dk'lık seanslar halinde Farkındalık Temelli Stres Azaltma programı uygulandı. Veriler, "Hemşire Bilgi Formu", "Profesyonel Yaşam Kalitesi Ölçeği-IV" ve "Algılanan Stres Ölçeği" ile toplanmıştır. Veriler Wilcoxon işaretli sıralar testi kullanılarak analiz edilmiştir. Eşleştirilmiş örneklem t-testleri için etki büyüklüklerini hesaplamak üzere Cohen d kullanılmıştır. **Bulgular:** Farkındalık Temelli Stres Azaltma programından sonra hemşirelerin mesleki yaşam kalitesinin alt boyutları olan merhamet yorgunluğu ve tükenmişlik puan ortalamaları istatistiksel olarak anlamlı düzeyde azalırken ($p<0,05$), hemşirelerin müdahale öncesi ve sonrası merhamet memnuniyet ve stres düzeyi puan ortalamaları arasında istatistiksel olarak anlamlı bir fark bulunmamıştır ($p>0,05$). **Sonuç:** Sağlık kurumları, hemşirelerin kendilerine bakım vermelerini başkalarına bakım vermekle aynı öncelik düzeyinde destekleyecek stratejileri göz önünde bulundurmalıdırlar. Farkındalık Temelli Stres Azaltma programının yaygınlaştırılması ve gelecek çalışmaların farklı gruplarda yapılması önerilmektedir. Hemşirelerin stres, tükenmişlik ve merhamet yorgunluğu açısından takip edilmesi ve önleyici eğitim programlarının uygulanması şiddetle tavsiye edilmektedir.

Anahtar Kelimeler: Tükenmişlik; merhamet yorgunluğu; farkındalık temelli stres azaltma; onkoloji hemşireliği; pediatri

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Childhood cancer is a global health problem. An estimated 300,000 children and adolescents ages 0-19 years old are diagnosed with cancer annually.[1] The availability of complete treatment options in high-income countries has resulted in the cure of 80-85% of children diagnosed with cancer; in low- and middle-income countries, the cure rate is less than 30%.[2] Diagnosis is the starting point of stress, and its short-term and long-term repercussions are related to experiences of the treatment process. During diagnosis and treatment, in addition to stress, worry, hopelessness, fear, wrath, and helplessness, these emotions can also impact children and parents physically and mentally.[3] Along with the parents and kids, these issues may also impact healthcare providers who provide care and treatment.[4] Healthcare workers, especially nurses, are under stress, burnout, and compassion fatigue from seeing patients die and suffer, from seeing their health status not improve despite receiving expert care, and from seeing the rising number of children dying from cancer.[5]

BACKGROUND, LITERATURE REVIEW

"Professional quality of life" (ProQOL) refers to the positive and negative feelings experienced by those in helping professions.[6] It includes compassion satisfaction (CS), the positive aspect, and compassion fatigue (CF), the negative aspect. CF consists of 2 components: Burnout-related to work stress and the work environment-and secondary traumatic stress, which results from direct exposure to trauma.[7] Although these are distinct conditions, they often share similar symptoms and can occur together.[8] Nurses are frequently exposed to their patients' pain and emotional distress. They build strong emotional bonds with the children in their care, which can reduce CS and increase CF.[9] Oncology nurses, in particular, are vulnerable to high stress and burnout due to heavy workloads and extended hours.[10]

While there is a growing body of research on stress and burnout in healthcare workers, studies focusing on prevention and well-being promotion are limited. Mindfulness-based therapies, which are scientifically validated awareness practices, have shown promise in reducing stress across various settings.[11] In healthcare, mindfulness has gained recognition as a holistic approach that enhances well-being and self-awareness.[12,13] Mindfulness meditation helps individuals become more aware of their emotional patterns and improves their ability to manage distress effectively.[14]

The Mindfulness-Based Stress Reduction (MBSR) program has become widely used among mindfulness-based interventions. MBSR teaches individuals to observe their thoughts and physical sensations through meditation techniques, such as the body scan. These techniques can be integrated into daily life, including during everyday tasks like eating, walking, or standing. MBSR aims to help individuals shift how they perceive and respond to challenging situations.[12] This shift can reduce emotional reactivity and enhance coping abilities. For cancer nurses, MBSR is a self-care tool supporting a healthier stress response.[15] Research shows that mindfulness practice can improve nurses' physical and mental health, reduce fatigue, anxiety, and stress, and lower levels of secondary traumatic stress and job burnout.[15,16]

THEORETICAL FRAMEWORK

"Holistic nurse self-care" core value of Mariano's holistic nursing theory was based on this study.[17] In holistic nursing, "care" includes the patient and the nurse. A fundamental tenet of holistic nursing is self-care. In the holistic approach, nurses are seen as a component of the physical setting that aids in recovering their patients.[18] Nurses can provide holistic patient care if they first create a healing environment for themselves and pay attention to their self-care. Therefore, a holistic nurse's self-care activity is a proactive measure of their ability to provide holistic care to patients.[19] Considering all this; it is critical to enhance the professional quality of life and lower the perceived stress level of pediatric oncology and hematology nurses. The research lacks information about the best ways for pediatric oncology nurses to handle stressful or challenging circumstances, and there is also limited information on the impact of mindfulness on these nurses' practice.[9,11,15] It is planned to apply MBSR as a holistic self-care program for nurses.

AIMS

This study's purpose was to assess the impact of the MBSR training on the perceived stress and professional quality of life (CF, burnout, CS) of pediatric oncology-hematology nurses.

Hypotheses

H_1: Perceived stress levels of nurses will decrease after MBSR.

H_2: CS levels of nurses will decrease after MBSR.

H_3: Burnout levels of nurses will decrease after MBSR.

H_4: CS levels of nurses will decrease after MBSR.

MATERIAL AND METHODS

DESIGN

This quasi-experimental, prospective study uses a pretest-posttest design. It was a nonrandomized trial conducted on a single group. The research was implemented following the "Transparent Reporting of Evaluations with Nonrandomized Designs (TREND) Statement Checklist".[20]

PARTICIPANTS AND SETTING

This study was conducted between November 15, 2021-June 15, 2022, with nurses who work in the pediatric oncology and hematology clinic of a private hospital in İstanbul.

The study population comprised 35 nurses working in the pediatric oncology and hematology clinics of a private hospital in İstanbul. The sample size for this study was determined using the G*Power (Version 3.1.9.7, Heinrich-Heine-Universität Düsseldorf, Germany) computer program, following the approach described by Faul et al.[21] The calculation was based on the study by Duarte&Pinto-Gouveia's recent study, using a medium effect size (d=0.60), α error=5%, and power (1-β)=80%.[11] The initial sample size was estimated to be 19 nurses, with an additional 10% added to account for potential dropouts, for a total target sample size of 21 nurses.

A convenience sampling method was used, inviting all nurses working in the pediatric oncology and hematology clinics to participate. Nurses who volunteered and met the inclusion criteria (attending a minimum of 6 out of 8 MBSR sessions) were included in the final analysis. Initially, 35 nurses were invited to participate in the first session of the MBSR program. Of these, 24 nurses volunteered to participate, but only 20 completed the study. Specifically, 3 nurses participated in only the first session; one nurse attended 5 sessions, and these were excluded from the study results; the remaining 20 nurses attended at least 6 sessions and completed the study.

Study Inclusion Criteria

Employment in the pediatric oncology and hematology clinics, willingness to participate in the research, and attending at least 6 MBSR sessions.

Study Exclusion Criteria

Visual, auditory, or psychiatric disorders that would interfere with participation in the MBSR program, not undergoing mindfulness-based training before or during the study, and missing 2 or more sessions of the MBSR program.

Instruments

Participants completed four questionnaires. The principles of the Declaration of Helsinki were followed at every stage of the research.

Nurse Information Form

The researchers developed a total of 6 questions. Questions pertained to the participant's age, gender, marital, educational status, number of years of experience, satisfaction with their working unit, and whether or not they were currently receiving coping training.[11,15,16]

Professional Quality of Life Scale-IV

This scale measures participants' professional satisfaction, burnout, and CS. Stamm developed the scale, and Yeşil et al. established its Turkish validity and reliability.[7,22] The ProQOL is a self-reported measurement tool consisting of 30 items with 3 sub-dimensions, measured using a Likert scale of 5 points, where 0 represents never, and 5 represents very often.

The 3 sub-dimensions of the scale are CS, burnout, and CF. A high score on the CS subscale indicates a high level of satisfaction or fulfillment as a helper, while a high score on the burnout scale indicates a high level of burnout. Psychological support is recommended for employees who score high on the CF sub-scale. The values of Cronbach's alpha for the CF, CS, and burnout were 0.89, 0.73, and 0.83, respectively. In the current study, Cronbach's alpha for the CF, CS, and burnout were 0.80, 0.89, and 0.62, respectively.

Perceived Stress Scale

Perceived Stress Scale (PSS) was developed by Cohen et al. and was used in this study to evaluate the perceived stress levels of the participants.[23] The Turkish validity and reliability of the scale were established by Eskin et al.[24] The PSS comprises 14 items designed to assess the perceived stress level in different situations. Each item is evaluated from "Never (0)" to "Very often (4)" on a 5-point Likert scale. A higher score indicates increased perceived stress. The Cronbach's alpha coefficient of the scale was found to be 0.78; in the current study, it was 0.55.

DATA COLLECTION PROCEDURE

Before the study, the researchers informed the nursing director and head of the pediatric oncology-hematology clinics of the purpose and scope of the study. The 3rd researcher explained the importance and potential benefits of the MBSR program for nurses. The nursing department director met with the nurses to set a time and day and explain the study's goal. The nurses were also informed about the dates and times of the 8 MBSR sessions that would be conducted as part of the study.

Before starting the MBSR program, the 3rd researcher sent out information to eligible nurses about the study and requested that they fill out Google Forms (Google LLC, Mountain View, CA, USA) for data collection. The MBSR program was led by the 3rd researcher, who had received prior training in MBSR and held an educator certificate. MBSR was administered to pediatric oncology and hematology nurses in groups for 8 weeks, for 8 sessions. Two groups were formed based on the nurses' shift schedules. All sessions were conducted online through the Zoom platform (Zoom Video Communications, Inc., San Jose, CA, USA) weekly for 60-90 minutes to facilitate nurses' participation and make it easier to reach the participants. The sessions were held on Tuesdays and Thursdays from 9-11 pm; those who couldn't attend their scheduled sessions were allowed to participate in the sessions on the alternate day. The sessions were organized to not coincide with the nurses' night shift. With participants' consent, sessions were recorded to permit review later.

The MBSR program consists of theoretical and practical parts, and the participants actively participate through dialogues. Each week, the Educator gave information about the subject and theme of the week with PowerPoint (Microsoft, ABD) presentations, and the active participation of the participants was supported. The program continued with theoretical and practical parts, and after each practice, feedback was received on the impact on the participants. Before starting the sessions, participants were asked for the materials to be used weekly (e.g., raisins, yoga mats, pillows, blankets, etc.). The MBSR program content specific to each week was applied, as shown in Table 1. Before each session, feedback from the previous session was received, and the practices performed in the previous week were evaluated. Zoom is a program that facilitates image, sound, and content sharing, and it was also preferred because it is easy for participants to access and use. Since the training was interactive, participants were asked to keep their camera images on during the session and to turn on their microphones during interactive participation. Questionnaires were administered to the nurses before the study and at the end of the 8 sessions to evaluate the program's effectiveness.

STATISTICAL ANALYSES

The data collected in the study were analyzed using SPSS version 28 (IBM, USA) software. The Shapiro-Wilk test was checked for normal distribution. Descriptive statistics such as percentages, standard deviations, and means were used to present the data. The Wilcoxon signed-rank test was conducted to analyze pairwise comparisons, and Cohen's d was used

TABLE 1: Stages of the MBSR Program

Week	Duration	Program title	Content of the sessions	Purpose and target
1st	60-90 minutes	Introduce and Explain Purpose	-Introduce to MBSR -Meeting the nurses -Discussing experiences and expectations	Introducing the program and meeting the nurses
2nd	60-90 minutes	Awareness	-What is awareness? -Being aware of activities in daily life -Raisin meditation	Introducing the concept of mindfulness, talking about their activities in their daily life, caring and noticing the little things
3rd	60-90 minutes	Our Perspectives on Ourselves and the World	-Breath Meditation -Habit breaker: Watch the sky	Increasing awareness of breathing, providing curiosity and awareness to situations encountered in daily life
4th	60-90 minutes	Body Scan	-Body scan -Ten finger gratitude app. -Habit breaker: Spending some time in nature.	To enable nurses to discover their bodies, to raise awareness in daily life so that they can appreciate the little things
5th	60-90 minutes	Mindful Movement Mindful Thinking Mindful Communication Mindful Breathing	-Mindfulness movement meditation -Sounds and thoughts meditation -Breathing meditation -Defining communication and mindful communication	Increasing awareness in movement, thought, breathing and communication in daily life
6th	60-90 minutes	Coping with Stress	-What is stress? -What are the elements of stress? -What are the ways to cope with stress?	Introducing stress, recognizing stressors and teaching methods of coping with stress.
7th	60-90 minutes	Dealing with Difficult Emotions	-Face-to-face meditation -Habit breaker: Planting a variety of seeds.	Reducing the stress of nurses by increasing their coping skills, enabling them to face the difficulties encountered in daily life.
8th	60-90 minutes	Staying in the Past or Living in the Present? Release	-Friendship meditation -Habit breaker: Doing random favors -Evaluate the program -Getting feedback	It was aimed to reduce the stress of nurses by increasing social interaction, to reinforce what has been learned and to evaluate the program.

MBSR: Mindfulness-Based Stress Reduction

to calculate the effect sizes for the paired-sample t-tests. Cohen's d values of 0.2, 0.2-0.5, and 0.8 indicated small, medium, and large effects, respectively.[25] Statistical significance was defined as a p value of less than 0.05.

ETHICAL CONSIDERATION

This study was conducted in accordance with the principles of the Declaration of Helsinki. İstanbul Beykent University Social Sciences Ethical Committee approved this study on November 8, 2021 (no: 89), and the head nurse manager gave written permission. The nurses provided written consent before the trial after being told its purpose and parameters. If a nurse decided not to continue, they were free to exit the study at any moment and without explanation. They were also informed that their submitted data would be kept confidential, published under anonymous codes, and utilized only for scientific purposes.

TABLE 2: The descriptive characteristics of nurses

Variables	X̄±SD	
Age (years)	29.80±7.09	
Working experiences (months)	9.20±7.42	
	n	%
Gender		
Female	19	95
Male	1	5
Education		
High school	5	25
Bachelor's degree	13	65
Master or doctora	2	10
Marital status		
Single	8	40
Married	12	60
Satisfaction with working clinics		
Yes	18	90
No	2	10
Receiving coping training		
Yes	7	35
No	13	65

SD: Standard deviation

RESULTS

DESCRIPTIVE CHARACTERISTICS

The study participants' descriptive features were displayed in Table 2. The mean age of the participants was 29.80±7.09 years, and the mean duration of nurses' work was 9.20±7.42 months. It was determined that of nurses, 95% were female, 65% had bachelor's degrees, 60% were married, 90% were satisfied to clinic where they work and 35% had received coping training.

COMPARE THE "PROQOL-IV" SUBSCALES AND THE "PPS" SCORE

Table 3 presents the distribution of the subscales of the "ProQOL Scale-IV" and the "PPS" scores for pre- and post-MBSR. There was no statistically significant difference (p=0.126) between the pre-MBSR CS score of 37.00 (31.00-39.75) and the post-MBSR score of 35.50 (29.00-38.75). The pre-MBSR Burnout score was 20.00 (16.25-23.75), and the post-MBSR score was 18.50 (13.25-22.75), showing a significant difference with a medium effect size (d=0.393) between the pre-and post-MBSR (p=0.017). The pre-MBSR CF score was 16.00 (12.00-18.75), and the post-MBSR score was 12.50 (10.00-18.75), indicating a significant difference with a medium effect size (d=0.380) between the pre-and

TABLE 3: The distribution of "ProQOL Scale-IV" subscales and the "PPS" according to the pre and post MBSR

	Pre-MBSR	Post-MBSR				95% CI	
	Median (25^{th}-75^{th})	Median (25^{th}-75^{th})	Test	p value	Effect size	Lower	Upper
CS	37.00 (31.00-39.75)	35.50 (29.00-38.75)	-1.532	0.126	0.289	-0.17	0.76
Burnout	20.00 (16.25-23.75)	18.50 (13.25-22.75)	-2.383	0.017	0.393	0.05	0.76
CF	16.00 (12.00-18.75)	12.50 (10.00-18.75)	-2.447	0.014	0.380	0.08	0.70
PPS	23.50 (21.00-25.75)	23.50 (20.25-25.00)	-0.587	0.557	0.135	-0.33	0.60

Bold values indicate statistically significant values. ProQOL: Professional quality of life; PPS: Perceived Stress Scale; Test: Wilcoxon signed ranks test; MBSR: Mindfulness-Based Stress Reduction; CI: Confidence interval; CS: Compassion satisfaction; CF: Compassion fatigue

post-MBSR (p=0.014). The pre-MBSR PPS score was 23.50 (21.00-25.75), and the post-MBSR score was 23.50 (20.25-25.00), with no significant difference between the pre-and post-MBSR (p=0.557) (Table 3).

DISCUSSION

This study is the first to examine the impact of MBSR training on stress, CF, burnout, and CS among Turkish pediatric oncology-hematology nurses. This study shows that among Turkish pediatric oncology-hematology nurses, MBSR training positively affected burnout and CF. Our results showed a significant decrease in burnout and CF scores following the MBSR intervention, consistent with findings from other studies.[11,26] The repeated exposure to trauma and grief can lead to CF in individuals who lack emotional control.[27] However, because mindfulness skills mediate in regulating interpersonal relationships faced with stressful events, controlling emotions, and controlling anger, mindfulness therapies such as MBSR reduce trauma-related symptoms and stabilize emotions, which may explain the reduction in burnout and CF scores observed in our study.[11,28] Improving self-care is an essential aspect of providing holistic patient care. Reducing burnout and CF scores may improve nurses' ability to achieve work-life balance and engage in self-care practices.

Our study found no significant difference between the pre-MBSR and post-MBSR levels of CS. Still, on the other hand, it is noteworthy that the CS levels of nurses decreased after the program. CS refers to nurses' satisfaction while providing care and feeling competent. Being a pediatric oncology-hematology nurse can be rewarding but also inherently stressful.[29] One review showed that the qualities that pediatric oncology nurses frequently cite as "rewards of the job" could also be a source of conflict because they often form close bonds with their patients and their families while employing coping mechanisms that promote self-preservation. Nurses in our study may have felt this tension, and their CS levels may not have changed positively after the MBSR training. Moreover, the construct of satisfaction is very complex, subjective, and multifactorial, and a modified MBSR treatment may not be sufficient to increase satisfaction levels significantly in a short period.[30] Since no environmental adjustments (regulating working hours or patient-nurse ratios, etc.) were made in the current program, it is possible that the MBSR training did not impact the mean CS scores of the nurses in our study. Organizational changes, including regulations on workload and institutional support, are crucial in improving nurses' satisfaction levels. The working conditions and workload of nurses were already negatively affected by the coronavirus disease-2019 pandemic. Also, because nurses perceived the workload as excessive in oncology, the MBSR program may not have affected the CS of nurses. Moreover, stress levels that did not decrease after MBSR also support this finding. These factors may have negatively affected nurses' work engagement and decreased their CS. Therefore, future research should investigate the long-term effects of MBSR on nurses' CS, focusing on institutional characteristics.

According to our research, the perceived stress levels before and after MBSR were not significantly different. This result contradicts numerous studies showing reduced perceived stress among nurses who participated in MBSR training.[26,31] Our findings may be attributed to the variation in occupational stressors across different hospitals, countries, and levels of nursing experience. Additionally, the results may be influenced by how perceived stress is defined. The level of stress that an individual experiences depends on their perception of an event's potential to cause stress; perceived stress levels reflect subjective stress.[32] The nurses may perceive excessive workloads in the oncology clinic and have continued to experience continuous stress, which the MBSR training may have yet to address fully. Further research is needed to examine institutional structures and training initiatives to improve stress reduction among nurses.

LIMITATIONS

This study has several limitations, particularly regarding the sample size. The sample may not be large enough to fully represent the broader population of pediatric oncology-hematology nurses, limiting the findings' generalizability. Additionally, a randomized control trial design could not be imple-

mented due to the limited number of nurses. The lack of a control group and uncontrolled individual factors (such as depression, family conflicts, personal stressors, and health problems) may also impact the study's results. These limitations should be considered when interpreting the findings, and future studies with larger sample sizes and more controlled designs are recommended. The MBSR program was administered online to nurses but is otherwise typically delivered face-to-face. The online format may have hindered the program's effectiveness, and further research is needed to explore this issue. The fact that most nurses in the sample had a bachelor's degree and above positively affected the educational intervention's effectiveness. Another limitation of the study is the low Cronbach's alpha value for PSS, which may be due to the small sample size and differences in participant characteristics. Finally, MBSR sessions were conducted late evening to align with nurses' shift schedules, which may have impacted their fatigue and engagement with the program.

IMPLICATIONS FOR NURSING

Pediatric oncology-hematology nurses are particularly vulnerable to CF, burnout, and stress. MBSR is an effective intervention in reducing these adverse outcomes by enhancing emotional regulation and improving coping skills. It is recommended that the MBSR program be widely disseminated, and future studies should investigate its effectiveness in various populations. It is essential to follow up with nurses experiencing stress, burnout, and CF and to implement preventive training programs. Institutions should prioritize supporting staff and promoting self-care as they care for others holistically. MBSR incorporated into hospitals' holistic nursing training activities emphasizes the importance of self-care through meditative movement practices. Finally, we suggest the MBSR training be repeated annually to maintain the program's benefits.

CONCLUSION

This study is the first to investigate the effect of MBSR on CF, burnout, CS, and perceived stress in Turkish pediatric oncology-hematology nurses. It found that MBSR reduced levels of CF and burnout but did not significantly impact the mean scores for CS and PS. Future studies should examine the long-term effects of MBSR training on pediatric oncology-hematology nurses using qualitative and quantitative methods. Furthermore, larger study samples from different organizations should be included to investigate the impact of mindfulness practices and holistic training on patient outcomes.

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Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: *Tuğba Pehlivan Sarıbudak, Remziye Semerci, Behice Belkıs Çalışkan, Güldem Yıldız, Nazife Altınel, Meryem Kapancı;* ***Design:*** *Tuğba Pehlivan Sarıbudak, Remziye Semerci, Behice Belkıs Çalışkan, Güldem Yıldız, Nazife Altınel, Meryem Kapancı;* ***Control/Supervision:*** *Tuğba Pehlivan Sarıbudak, Remziye Semerci, Behice Belkıs Çalışkan;* ***Data Collection and/or Processing:*** *Tuğba Pehlivan Sarıbudak, Remziye Semerci, Behice Belkıs Çalışkan, Güldem Yıldız, Nazife Altınel, Meryem Kapancı;* ***Analysis and/or Interpretation:*** *Tuğba Pehlivan Sarıbudak, Remziye Semerci, Behice Belkıs Çalışkan;* ***Literature Review:*** *Tuğba Pehlivan Sarıbudak, Remziye Semerci, Behice Belkıs Çalışkan;* ***Writing the Article:*** *Tuğba Pehlivan Sarıbudak, Remziye Semerci, Behice Belkıs Çalışkan, Güldem Yıldız, Nazife Altınel, Meryem Kapancı;* ***Critical Review:*** *Tuğba Pehlivan Sarıbudak, Remziye Semerci, Behice Belkıs Çalışkan, Güldem Yıldız, Nazife Altınel, Meryem Kapancı;* ***References and Fundings:*** *Tuğba Pehlivan Sarıbudak, Remziye Semerci, Behice Belkıs Çalışkan, Güldem Yıldız, Nazife Altınel, Meryem Kapancı;* ***Materials:*** *Tuğba Pehlivan Sarıbudak, Remziye Semerci, Behice Belkıs Çalışkan, Güldem Yıldız, Nazife Altınel, Meryem Kapancı.*

REFERENCES

1. Pediatric Cancer Research Foundation [Internet]. [Cited: May 23, 2022]. Childhood Cancer Statistics. Accessed. [Link]
2. World Health Organization. © 2024 WHO [Cited: May 23, 2022]. CureAll framework: WHO global initiative for childhood cancer: increasing access, advancing quality, saving lives. Available from: [Link]
3. Barrett PM, Mullen L, McCarthy T. Enduring psychological impact of childhood cancer on survivors and their families in Ireland: a national qualitative study. Eur J Cancer Care (Engl). 2020;29(5):e13257. [Crossref] [PubMed] [PMC]
4. Arimon-Pagès E, Torres-Puig-Gros J, Fernández-Ortega P, Canela-Soler J. Emotional impact and compassion fatigue in oncology nurses: results of a multicentre study. Eur J Oncol Nurs. 2019;43:101666. [Crossref] [PubMed]
5. Blackwell A. Overcoming compassion fatigue and burnout in pediatric oncology nurses: Implementation of a staff well-being program. Journal of Pediatric Hematology/Oncology Nursing. 2024;41(6): 408-18. [Crossref] [PubMed]
6. Phillips CS, Volker DL. Riding the roller coaster: a qualitative study of oncology nurses' emotional experience in caring for patients and their families. Cancer Nurs. 2020;43(5):E283-90. [PubMed]
7. Stamm BH. The ProQOL Manual. he Professional Quality of Life Scale: Compassion satisfaction, burnout and compassion fatigue/secondary trauma scales. Sidran Press; 2005. [Link]
8. Ortega-Campos E, Vargas-Román K, Velando-Soriano A, Suleiman-Martos N, Cañadas-de la Fuente GA, Albendín-García L, et al. Compassion fatigue, compassion satisfaction, and burnout in oncology nurses: a systematic review and meta-analysis. Sustainability, 2022;12(1):72. [Crossref] [PubMed]
9. Semerci R, Sarıbudak TP, Çalışkan BB, Altınel Dalmış N, Yıldız G, Kapancı M. The effect of mindfulness-based stress reduction on pediatric oncology nurses' stress level, and pediatric oncology patients' psychosocial symptoms and care satisfaction: a prospective non-randomized trial. Holist Nurs Pract. 2024. [PubMed]
10. O'Dea A, Caulfield RA, Roche MA. Impact of the practice environment on oncology and hematology nurses: a scoping review. Cancer Nursing. 2023;46(4):265-76. [Crossref]
11. Duarte J, Pinto-Gouveia J. Effectiveness of a mindfulness-based intervention on oncology nurses' burnout and compassion fatigue symptoms: a non-randomized study. Int J Nurs Stud. 2016;64:98-107. [Crossref] [PubMed]
12. Guu SF, Chao YP, Huang FY, Cheng YT, Ng HH, Hsu CF, et al. Interoceptive awareness: MBSR training alters information processing of salience network. Front Behav Neurosci. 2023;17:1008086. [Crossref] [PubMed] [PMC]
13. Iyer S. Mindfulness-based interventions: can they improve self-care and psychological well-being? Indian J Crit Care Med. 2022;26(4):407-8. [Crossref] [PubMed] [PMC]
14. Kabat-Zinn J. Indra's net at work: the mainstreaming of Dharma practice in society. In G. Watson; Batchelor S, eds. The Psychology of Awakening: Buddhism, Science, and Our Day-to-Day Lives. 1st ed. USA: Red Wheel/Weiser; 2000.
15. Shi Y, Wang P, Liu L, Li M. Mindful self-care among oncology nurses in China: a latent profile analysis. BMC Nurs. 2024;23(1):474. [Crossref] [PubMed] [PMC]
16. Wang Q, Wang F, Zhang S, Liu C, Feng Y, Chen J. Effects of a mindfulness-based interventions on stress, burnout in nurses: a systematic review and meta-analysis. Front Psychiatry. 2023;14:1218340. [Crossref] [PubMed] [PMC]
17. Mariano C. Holistic nursing as a specialty: holistic nursing - scope and standards of practice. Nurs Clin North Am. 2007;42(2):165-88, v. [Crossref] [PubMed]
18. Mariano C. Holistic Nursing: Scope and standards of practice. 2nd ed. US: American Holistic Nurses Association; 2013. [Crossref] [PubMed]
19. Hilcove K, Marceau C, Thekdi P, Larkey L, Brewer MA, Jones K. Holistic nursing in practice: mindfulness-based yoga as an intervention to manage stress and burnout. J Holist Nurs. 2021;39(1):29-42. Erratum in: J Holist Nurs. 2022;40(3):NP1-5. [Crossref] [PubMed]
20. Des Jarlais DC, Lyles C, Crepaz N; TREND Group. Improving the reporting quality of nonrandomized evaluations of behavioral and public health interventions: the TREND statement. Am J Public Health. 2004;94(3):361-6. [Crossref] [PubMed] [PMC]
21. Faul F, Erdfelder E, Lang AG, Buchner A. G*Power 3: a flexible statistical power analysis program for the social, behavioral, and biomedical sciences. Behav Res Methods. 2007;39(2):175-91. [Crossref] [PubMed]
22. Yeşil A, Ergün Ü, Amasyalı C, Er F, Olgun NN, Aker AT. Çalışanlar için yaşam kalitesi ölçeği Türkçe uyarlaması geçerlik ve güvenilirlik çalışması [Validity and reliability of the Turkish version of the Professional Quality of Life Scale]. Archives Of Neuropsychiatry/Noropsikiatri Arsivi. 2010;47(2):111-7. DOI: [Crossref] [PubMed]
23. Cohen S, Kamarck T, Mermelstein R. A global measure of perceived stress. J Health Soc Behav. 1983;24(4):385-96. [PubMed]
24. Eskin M, Harlak H, Demirkıran F, Dereboy Ç. Algılanan stres ölçeğinin Türkçeye uyarlanmasi: güvenirlik ve geçerlik analizi [The adaptation of the Perceived Stress Scale into Turkish: a reliability and validity analysis]. New/Yeni Symposium Journal. 2013;51(3):132-40. [Link]
25. Cohen J. Statistical Power Analysis for the Behavioral Sciences. 2nd ed. New Jersey: Lawrence Erlbaum; 1988. [Crossref] [PubMed]
26. Talebiazar N, Anzali BC, Abbasi M, Azizi N, Goli R, Faraji N, et al. Does mindfulness-based stress reduction training have an impact on the occupational burnout and stress experienced by nurses? A randomized controlled trial. Int Arch Occup Environ Health. 2025;98(1):1-11. [Crossref] [PubMed]
27. Hayuni G, Hasson-Ohayon I, Goldzweig G, Bar Sela G, Braun M. Between empathy and grief: The mediating effect of compassion fatigue among oncologists. Psychooncology. 2019;28(12):2344-50. [Crossref] [PubMed]
28. Suleiman-Martos N, Gomez-Urquiza JL, Aguayo-Estremera R, Cañadas-De La Fuente GA, De La Fuente-Solana EI, Albendín-García L. The effect of mindfulness training on burnout syndrome in nursing: a systematic review and meta-analysis. J Adv Nurs. 2020;76(5):1124-40. [Crossref] [PubMed]
29. Zarenti M, Kressou E, Panagopoulou Z, Bacopoulou F, Kokka I, Vlachakis D, et al. Stress among pediatric oncology staff. A systematic review. EMBnet J. 2021;26:e981. [Crossref] [PubMed] [PMC]
30. Macintyre MR, Brown BWJ, Schults JA. Factors influencing pediatric hematology/oncology nurse retention: a scoping review. J Pediatr Hematol Oncol Nurs. 2022;39(6):402-17. [Crossref] [PubMed]
31. Truscott PL. Effects of mindfulness-based stress reduction programs on Nurses' perceived stress levels. Geriatr Nurs. 2024;58:512-7. [PubMed]
32. Hepburn SJ, Carroll A, McCuaig L. The relationship between mindful attention awareness, perceived stress and subjective wellbeing. Int J Environ Res Public Health. 2021;18(23):12290. [Crossref] [PubMed] [PMC]