

Development of a Mindfulness-Based Stress Reduction Program for Hematologic Malignancy Patients: A Delphi Study

Junye Yu ¹, Xiu Zheng², Dan Hua¹, Huanxia Xu², Zexuan Li², Huanhuan Song¹

¹Department of Nursing, Aerospace Center Hospital, Beijing, People's Republic of China; ²Department of Hematology, Aerospace Center Hospital, Beijing, People's Republic of China

Correspondence: Junye Yu, Aerospace Center Hospital, N0.15 Yuquan Road, Haidian District, Beijing, People's Republic of China, Email handanyuyj@126.com

Purpose: Hematologic malignancies (HM) are a group of malignant clonal diseases that pose significant treatment challenges and adversely impact patient survival and quality of life. This study aimed to develop a Mindfulness-Based Stress Reduction (MBSR) program specifically for HM patients and to refine it for application in China.

Patients and Methods: A research team comprised of nursing directors, psychology experts, and other professionals was established, and then a literature review was conducted to assemble information needed to develop the MBSR intervention protocol. Following this, a Delphi expert consultation plan, consisting of two rounds of expert consultations, was carried out to evaluate and refine the MBSR intervention protocol.

Results: A total of 15 hematologic disease experts and 15 psychology experts participated in the Delphi expert consultations, with a 100% questionnaire response rate achieved in both rounds. The results of the expert consultations indicated a progressive convergence of expert opinions, with calculated Expert Judgment Basis, Familiarity with Content, and Expert Authority Coefficient values of 0.882, 0.809, and 0.846 in the first round, and 0.92, 0.83, and 0.875 in the second round, respectively. The finalized content contains 2 primary, 9 secondary, and 27 tertiary items.

Conclusion: This study developed an MBSR intervention program for patients with HM using the Delphi method for evaluation and refinement through expert consultations. The standardized program provides effective psychological support and physiological adjustment strategies for Chinese patients with HM, and offers a practical protocol for integration into clinical and psychosocial oncology care in China.

Keywords: hematologic malignancies, mindfulness-based intervention, multidisciplinary collaboration, patient-centered care, treatment outcomes

Introduction

Hematologic malignancy (HM) encompasses a group of malignant clonal diseases originating from the bone marrow, lymphatic tissues, and blood, including specific subtypes such as leukemia (acute myeloid leukemia, acute lymphoblastic leukemia, chronic myeloid leukemia), lymphoma (Hodgkin lymphoma, non-Hodgkin lymphoma), myelodysplastic syndromes, and multiple myeloma, all confirmed by bone marrow morphology, immunology, cytogenetics, and molecular biology (MICM) or pathological examination.¹ These diseases are characterized by a high degree of malignancy and rapid progression and pose significant treatment challenges, severely diminishing patient survival and quality of life.² Statistical studies indicate that approximately 918,000 are diagnosed with HM worldwide annually.³

The etiology of HM is complex, potentially involving genetic mutations, environmental exposures, and immune dysregulation, among other factors.⁴ Treatment typically includes lengthy and arduous courses such as chemotherapy, radiation therapy, and bone marrow transplantation, imposing a heavy economic burden on patients and their families.⁵ Due to the uncertainty related to the disease and the side effects of treatment, patients often experience psychological issues such as anxiety and depression, as well as significant sleep disturbances, leading to a decline in quality of life.⁶

In the 1970s, Dr. Jon Kabat-Zinn introduced Mindfulness-Based Stress Reduction (MBSR) as the third wave of cognitive-behavioral therapy, and MBSR has proven to be an effective intervention for promoting mental health.⁷ MBSR cultivates mindfulness and acceptance of the present moment, helping individuals better cope with stress, emotions, and pain, thereby enhancing their psychological well-being.⁸ In addition to its widespread application in the management of mental health, MBSR has also been applied to help patients cope with various physiological discomforts caused by clinical diseases to achieve effects such as pain management and immune modulation, with significant results.⁹

However, despite the extensive international application and research of MBSR, its use in China is still in its infancy. Therefore, it is necessary to further explore the applicability, target population, and long-term effects of MBSR in China, particularly for special populations such as patients with HM. The present study was designed to enrich and refine the content of MBSR based on actual conditions of HM patients with the objectives of developing standardized methods tailored to this specific population and to explore the role and effectiveness of MBSR in improving patients' psychological and physiological states. This research is expected to provide more effective psychological support and physiological adjustment for patients with HM, thereby enhancing their quality of life and treatment outcomes, and to offer new insights and methods for comprehensive treatment in China.

Materials and Methods

Research Team

Establishing a research team was a crucial step in ensuring the comprehensive and efficient implementation of this study. The team included professionals from multiple disciplines, including a Director of Nursing, a Department Director, a Head Nurse, a Deputy Chief Nurse, specialized nurses, and psychology experts. Individual members of the research team were assigned different responsibilities and roles, and worked closely together to advance the progress of the study.

The Director of Nursing played a central leadership role in the team and was responsible for overall planning and decision-making regarding the project, ensuring its smooth progress. Additionally, this person was in charge of selecting suitable expert members and conducting consultations to ensure the professionalism and scientific rigor of the study.

The Department Director and Head Nurse were responsible for specifically coordinating program implementation within the research. They organized and arranged the implementation of various activities, ensuring the smooth progress of the research process and coordinating solutions to potential problems and difficulties.

As a crucial member of the team, the Deputy Chief Nurse was responsible for the construction and design of the program. Drawing on extensive clinical experience and professional knowledge, this person formulated scientifically sound research plans tailored to the study's objectives and requirements.

Specialized nurses were integral members of the research team, tasked with formulating, distributing, and collecting expert inquiry questionnaires. With their wealth of clinical experience and professional skills, they effectively carried out related tasks, providing strong support for the research.

Psychology experts were essential members of the research team, assisting in the development and implementation of MBSR therapy. With their extensive knowledge of psychology and clinical experience, they provided professional psychological support and guidance to patients, ensuring the smooth and effective implementation of the study.

Through the establishment of this multidisciplinary, closely coordinated research team, it was possible to fully leverage the professional strengths of each member, promote the smooth progress of the research work, ensure the scientific validity and reliability of the research results, and provide better psychological support and nursing services for patients with HM.

Construction of MBSR Therapy for HM Patients

Literature Review

A comprehensive literature review was conducted to search, compile, and analyze relevant studies on MBSR therapy conducted in China and around the world. This review served as a reference for developing the intervention protocol in this study. Utilizing search terms such as "Mindfulness" OR "MBSR" OR "Mindfulness-based stress reduction" AND "Randomized Controlled Trial" OR "Comparative Study" OR "Clinical trial", searches were performed in English

databases including Web of Science, PubMed, and MEDLINE. Additionally, the Chinese databases Wanfang Medical Online and China National Knowledge Infrastructure (CNKI) were searched using corresponding Chinese terms. The search period was limited from database inception to the present data.

The inclusion criteria for literature screening were as follows: 1) studies involving clinical patients; 2) primary intervention method of MBSR therapy; and 3) main outcome indicators including anxiety, depression, quality of life, and sleep disturbances. The exclusion criteria were: 1) full text not available; 2) duplicate publication; 3) violation of statistical analysis principles; and 4) data in the literature not applicable.

Through the literature search, a total of 102 relevant articles were initially retrieved, including 68 published in English and 34 published in Chinese. Two researchers independently screened the articles according to the inclusion and exclusion criteria. After the exclusion of 86 articles, 2 Chinese articles^{10,11} and 10 English articles^{12–22} were retained. A thorough review of these studies provided an understanding of the current status of patients with HM and the progress in related nursing research. Combined with clinical practical issues, a preliminary intervention protocol for MBSR therapy for HM patients was developed, including 3 primary indicators, 12 secondary indicators, and 31 tertiary indicators.

Mindfulness Therapy Protocol Development

Insights gained from the articles identified in the literature review were integrated with clinical expertise and practical considerations in the preliminary construction of MBSR therapy specifically tailored to patients with HM. Based on the findings from the literature review and considering the unique needs and challenges faced by patients with HM, key components of MBSR therapy were identified. These components encompassed mindfulness meditation techniques, cognitive-behavioral strategies, relaxation exercises, and psychoeducation. Given the distinctive characteristics of HM and their impact on patients' physical and psychological well-being, adaptations were made to traditional MBSR techniques. These adaptations aimed to address specific symptoms and concerns commonly experienced by patients with HM, such as fatigue, pain, treatment-related anxiety, and emotional distress.

Building upon the identified key components and adaptations, an intervention protocol was formulated through collaboration among members of the research team, including nursing directors, clinical specialists, psychologists, and specialized nurses. Each member contributed their expertise to ensure the comprehensive and effective design of the MBSR therapy program. The intervention protocol detailed the structure, content, and delivery methods of MBSR therapy for patients with HM, specifying the sequence of sessions, duration of each session, specific mindfulness exercises, and strategies for addressing individual needs and preferences.

Before implementation of the intervention protocol, pilot testing was performed with a small group of patients to evaluate its feasibility, acceptability, and preliminary efficacy. Feedback from patients and healthcare providers was collected and used to refine the protocol, ensuring its relevance and effectiveness in the context of HM.

In summary, the preliminary construction of MBSR therapy for patients with HM was achieved by identifying key intervention components, adapting techniques for the specific population, developing an intervention protocol in collaboration with the research team, and refining the protocol through pilot testing. This process aimed to create a tailored and evidence-based intervention that addresses the unique needs of patients with HM and enhances their psychological well-being and quality of life.

Delphi Expert Consultation

Development of Expert Consultation Questionnaire

To apply the expert opinions effectively, a structured questionnaire was devised, building upon the insights gleaned from the literature review and the initial framework of MBSR therapy for patients with HM. The questionnaire contained three sections: 1) the Introduction, which provided a brief overview of the research plan and guidelines for completing the questionnaire to ensure clarity and consistency in responses; 2) the Main Questionnaire, which presented the expert opinion table on MBSR therapy for HM patients. Utilizing a Likert scale ranging from “extremely important” to “not important at all”, experts rated the importance of each indicator. Additionally, experts were asked to offer modifications and suggestions for each item to acquire comprehensive feedback. Furthermore, an item addition/deletion section was included, which allowed experts to propose additional indicators deemed relevant or to suggest removal of those deemed

redundant; and 3) the Basic Information Survey, which gathered demographic data and aimed to ascertain the level of familiarity of experts with the consultation content, ensuring a diverse and well-informed expert panel.

Expert Selection Criteria

Stringent criteria were applied to ensure the selection of highly qualified experts: 1) Expertise: Specialization in hematologic oncology (clinical nursing, medical oncology), clinical psychology, or nursing psychology, with academic or clinical focus on psychosocial support for cancer patients. 2) Qualifications and Experience: Minimum educational background of a bachelor's degree; professional title of intermediate or higher (eg, associate chief nurse, chief psychologist); and at least 10 years of full-time clinical or research experience in hematologic malignancies or mindfulness-based interventions. 3) Voluntary Participation: Confirmed willingness to participate voluntarily, provide informed consent, and engage in two rounds of consultations.

A total of 15 experts were recruited, and their authority and expertise were gauged through a self-assessment of familiarity with the intervention plan and judgment criteria to ensure they provided a balanced and representative panel.

Implementation of Expert Consultation

In the first round of consultations held in February 2023, we distributed consultation questionnaires to experts via electronic communication channels, including email and WeChat, with a specified 1-week deadline for responses. To ensure the completeness and accuracy of the responses, we implemented rigorous quality control measures and promptly took follow-up actions to address any missing or unclear information.

Following a thorough analysis of the consultation results, we conducted project selection based on average importance scores and coefficients of variation. Projects meeting the predetermined criteria were retained, ie, projects with an average importance score ≥ 4 and a coefficient of variation < 0.25 .²³ Any discrepancies among expert opinions were carefully reviewed by the research team. Using the feedback from the experts, we refined and adjusted the intervention plans to enhance their effectiveness and relevance.

Subsequently, in the second round of consultations held in June 2023, similar protocols were adopted. The consultation outcomes indicated a growing consensus among the experts, ultimately signaling the conclusion of the consultation process.

Throughout this period, we conducted consultations and discussions via electronic communication channels, rigorously maintaining quality, and adjusted and improved the plans based on expert feedback to ensure the efficiency and relevance of the final plan.

Statistical Methods

Data analysis was conducted using SPSS 22.0 software. Descriptive analysis was employed to depict the data using measures such as the mean, standard deviation, and coefficient of variation. Furthermore, the level of expert engagement was reflected by the questionnaire response rate, providing insight into the experts' attentiveness and participation in the study. To assess the authority of the experts, we introduced the Expert Authority Coefficient (Cr), which was calculated as follows: $Cr = (Ca + Cs)/2$, where Ca represents the experts' judgment basis for the indicators and Cs indicates their familiarity with the research content. By considering both the experts' evaluation criteria and their familiarity with the research content, we derived a comprehensive Expert Authority Coefficient to assess their contributions and influence on the study. To evaluate the consistency of expert opinions on various indicators, and thus, the stability of the expert panel, we calculated Kendall's concordance coefficients for each indicator was calculated. Additionally, the Analytic Hierarchy Process (AHP) was utilized to calculate the weights of each indicator and their combined weights, followed by consistency testing. The results reflected the importance of each indicator in the overall study and for evaluating the interrelationships and influences among them. Finally, a significance level of $P < 0.05$ was applied to determine whether differences observed in the data analysis results were statistically significant.

Results

Expert Demographic Information

A total of 15 hematologic disease experts and 15 psychology experts from eight tertiary hospitals in Beijing were selected to participate in two rounds of consultations.

In the first round of consultations, the 15 experts included 4 experts aged between 30 and 39 years, 8 aged between 40 and 49 years, and 3 aged 50 years or older. Additionally, 9 experts held a master's degree or higher, while 8 held an associate senior professional title or higher. Moreover, this panel included 8 experts specializing in hematology and 5 specializing in psychology, with 2 experts serving in administrative roles.

In the second round of consultations, the 15 experts included 3 aged between 30 and 39 years, 8 aged between 40 and 49 years, and 4 aged 50 years or older. Furthermore, 7 experts held a master's degree or higher, while 10 held an associate senior professional title or higher. Additionally, this panel included 9 experts specializing in hematology and 4 specializing in psychology, with 2 experts serving in administrative roles.

These experts were chosen for their diverse backgrounds, qualifications, and expertise to ensure the provision of comprehensive insights and perspectives in the consultation process.

Expert Engagement and Authority

In the two rounds of consultations, a total of 15 questionnaires were collected for each round, for a response rate of 100% in both rounds. During the first round of consultations, 8 experts (53.33%) provided modification suggestions, while in the second round, 2 experts (13.33%) offered modification suggestions.

For the experts in the first round of consultations, the calculated Expert Judgment Basis (Ca), Familiarity with Content (Cs), and Expert Authority Coefficient (Cr) values were 0.882, 0.809, and 0.846, respectively. For those in the second round of consultations, the calculated Ca, Cs, and Cr values were 0.92, 0.83, and 0.875, respectively.

These statistical results indicated a high level of engagement among the experts, with a majority providing valuable feedback during the first round of consultations. The consistent participation and contribution of experts across both rounds underscore the robustness and credibility of the consultation process. Moreover, the calculated Cr values reflect the combined influence of experts' judgment basis and familiarity with the research content, further affirming the reliability and expertise of the consulted panels.

Degree of Expert Opinion Coordination

The coefficient of coordination for the two rounds of expert consultations yielded P values ranging from 0.002–0.000, with coefficients of variation ranging from 0–0.32. These results indicate that the opinions of the experts trended towards consensus, and the degree of coordination progressively increased. The statistically significant P values indicate a high level of agreement among the opinions and suggestions of the experts. Additionally, the low coefficient of variation suggests a minimal degree of variability in the experts' responses across both rounds of consultations. These findings underscore the effectiveness of the consultation process in fostering consensus and coherence among the experts. The increasing degree of coordination observed over the two rounds further validates the reliability and robustness of the expert opinions obtained, enhancing the credibility of the study outcomes.

Expert Consultation Feedback

Following the first round of expert consultations, modifications were made to items of the MBSR therapy for HM patients based on the selection criteria and expert opinions, as outlined below:

Revision of Inclusion and Exclusion Criteria

- Modified the diagnostic criteria for HM to include patients diagnosed with HM confirmed by bone marrow morphology, immunology, cytogenetics, and molecular biology (MICM) $\pm$ pathological examination.
- Adjusted the expected survival period to ≥ 3 –6 months.
- Excluded individuals who had taken psychotropic drugs in the previous month or had undertaken mindfulness-related courses systematically and/or persistently.

- Eliminated criteria such as intervention interruptions occurring four or more times due to disease exacerbation or physical reasons, and inability to continue participating in the program due to uncontrollable factors.

Refinement and Revision of Intervention Frequency and Duration

- The intervention duration was set at 8 weeks, with weekly group sessions held on Fridays at 3:00 PM for 45–60 min.
- Participants were required to engage in homework exercises and daily supervision for at least 3–5 days per week. Exercise content was posted by researchers in WeChat groups, and participants could check in daily after completing their exercises. They were encouraged to share insights, experiences, and photographs, and researchers would provide positive feedback upon successful check-ins.

Refinement and Revision of Intervention Themes and Content

- Mindful breathing was moved from the third week to the first week, while body scanning was shifted from the first week to the third week.
- Mindful eating was moved from the sixth week to the second week.
- “Mindful walking” was changed to “walking meditation” based on expert suggestions that mindful walking sessions are typically short, lasting 10–15 min, and can be interspersed with quiet practices such as mindful breathing and body scanning. Encouraging mindfulness during daily walks led to this modification.

Following the second round of expert consultations, no items were added or removed. However, the food item “chocolate” in the mindful eating theme was replaced with “raisins” due to concerns raised by experts regarding the melting nature of chocolate and its inapplicability to all patients. Additionally, experts suggested extending the duration of weekly group sessions to 1.5 or 2 h to accommodate practice time, considering that 45 min to 1 h might be insufficient. However, this recommendation was tempered by considerations for the physical condition of the patients, necessitating respect for their practical circumstances.

Finally, the MBSR therapy for HM patients constructed in this study included 2 primary items, 9 secondary items, and 27 tertiary items (Table 1).

Discussion

Using the Delphi methods, this study developed an MBSR therapy program tailored for patients with HM. The program consists of 2 primary items, 9 secondary items, and 27 tertiary items, ensuring comprehensive coverage of content. To the best of our knowledge, this is the first available MBSR therapy program designed specifically to provide effective psychological support and physiological adjustment for patients with HM.

Scientific Reliability of MBSR Therapy Program for HM Patients

The MBSR approach, proposed by Dr. Jon Kabat-Zinn,²⁴ is an effective intervention method for supporting the maintenance of mental health. It is primarily used to correct sub-health states, improve emotional management, and treat various psychological issues. It is also applied to assist patients with managing various physiological discomforts caused by clinical diseases. Currently, the MBSR approach is mostly based on the intervention method established by Dr. Kabat-Zinn.²⁵ The program developed in the present study is also based on this approach, which involves conducting a literature review to search, organize, and analyze related studies on MBSR both in domestic and international populations. Ultimately, two Chinese articles and ten English articles were included. Based on the results of the literature search, a systematic review of MBSR for HM patients was formed, and a preliminary draft of the MBSR program for HM patients was developed, which has been published.²⁶

The Delphi method, introduced and conceptualized by the Rand Corporation in 1964, is a consulting and decision-making technique that is applicable across diverse fields. Central to its approach is the anonymous solicitation of input from a panel of experts through multiple rounds of consultation.²⁷ In the present study, the Delphi expert consultation method was then employed, with two rounds of expert consultations conducted to revise and refine the indicators, ensuring the scientific validity and reliability of the constructed intervention program. As described in the Results

Table I Components of Mindfulness-Based Stress Reduction (MBSR) Therapy for Patients with Hematologic Malignancies (HM)

Indicator			Importance Score (Points, Mean $\pm$ Standard Deviation)	Coefficient of Variation
A Research Participants	A1 Intervention Inclusion Criteria	A1-1: Age 18 years or older and younger than 70 years	5.000 $\pm$ 0.000	0.000
		A1-2: Diagnosis of HM through bone marrow MICM $\pm$ histopathological examination	4.643 $\pm$ 0.488	0.105
		A1-3: Requirement of hematopoietic stem cell transplantation	4.714 $\pm$ 0.488	0.104
		A1-4: Karnofsky Performance Score (KPS) >70 points	4.786 $\pm$ 0.414	0.087
		A1-5: Expected survival period ≥ 3 –6 months	4.857 $\pm$ 0.352	0.072
		A1-6: Informed about the disease diagnosis, willing to participate in this study voluntarily, and willing to sign an informed consent form	5.000 $\pm$ 0.000	0.000
		A1-7: Conscious and able to understand and complete questionnaire surveys and MBSR-related exercises	4.571 $\pm$ 0.632	0.138
	A2 Intervention Exclusion Criteria	A2-1: Severe illness or other serious physical condition	4.643 $\pm$ 0.488	0.105
		A2-2: Diagnosis of severe mental illness or cognitive impairment	4.714 $\pm$ 0.458	0.097
		A2-3: Use of psychotropic drugs in the previous month	4.571 $\pm$ 0.640	0.140
		A2-4: Previous experience with systematic learning and/or long-term adherence to mindfulness-related courses	4.571 $\pm$ 0.507	0.111
	A3 Intervention Elimination Criteria	A3-1: Intervention was interrupted four or more times due to worsening condition or physical reason	4.786 $\pm$ 0.414	0.087
		A3-2: Unable to continue participating in the program due to uncontrollable factors	4.929 $\pm$ 0.352	0.071
B Intervention Plan	B1 Intervention Method	Due to different treatment timelines, patients may be either in the hospitalization phase or the in-home recovery phase. Therefore, the researchers plan to adopt a combined online and offline group intervention approach. Online sessions will be conducted via Tencent Meeting for video lectures, with each session accommodating 10–12 participants. Prior to the intervention, information about the class schedule, venue, and instructions will be communicated to the patients in a WeChat group to ensure they receive the intervention on time.	4.143 $\pm$ 0.561	0.135
	B2 Intervention Frequency and Schedule	The intervention duration is a total of 8 weeks, with one group meeting per week scheduled for Friday afternoons at 3:00 PM, lasting for 45–60 min each. Additionally, after each session, there will be homework exercises and daily supervision for at least 3–5 days per week. The researchers will post exercise content in the WeChat group, and patients can check in daily after completing their exercises. Patients can also share their insights, experiences, and photographic records on the check-in mini-program. Researchers will provide positive feedback upon successful check-ins.	4.714 $\pm$ 0.458	0.097
	B3 Intervention Location	Select a quiet and comfortable environment: Hospitalized patients will be provided with quiet classrooms for instruction, while patients in the in-home recovery phase can choose a quiet home environment where external disturbances are minimized. If necessary, family members can provide assistance and guidance.	4.500 $\pm$ 0.516	0.115
	B4 Intervention Team	The multidisciplinary research team includes the Director of the Nursing Department, Department Director, Head Nurse, graduate students, specialized nurses, and psychology experts. The teaching staff consists of researchers who have received formal training in MBSR therapy. Additionally, experienced MBSR experts rigorously supervise the content and quality of the teaching to ensure the smooth implementation of the intervention.	4.357 $\pm$ 0.507	0.116
	B5 Intervention Objectives	Based on MBSR therapy and in conjunction with the results of preliminary investigations, an MBSR therapy program for patients with HM has been developed, targeting the main causes of negative emotions, sleep disorders, and poor quality of life. The objectives of the targeted MBSR therapy are to alleviate various negative emotions and sleep disorders in HM patients and to improve their quality of life. Throughout the entire design and implementation process of the intervention, MBSR therapy is actively utilized to teach patients how to use mindfulness to perceive things around them, thereby releasing negative emotions, maintaining a pleasant and stable mood, and promoting the recovery process.	4.429 $\pm$ 0.507	0.115

(Continued)

Table 1 (Continued).

Indicator					Importance Score (Points, Mean ± Standard Deviation)	Coefficient of Variation	
	B6 Intervention Content	B1-I: Introduction Session: Prior to the intervention, personal files are established for patients and individualized 10- to 20-min pre-training and communication sessions are conducted with patients entering the intervention group. Each patient's willingness to participate in the intervention and desired outcomes are explored. Common questions include: What are your reasons for deciding to participate in this course? What do you hope to gain from this training? And others.			4.357±0.724	0.166	
		Intervention Time	Intervention Theme	Intervention Content	Homework Exercises and Key Points		
		B6-I: Week I	Discovering the Wonders of Life - Mindful Breathing	1) Introduce group members to each other; explain the content and schedule of the MBSR training program; and instruct patients in advance to take care of themselves throughout the entire intervention process. If any discomfort arises during hospitalization, patients are encouraged to promptly provide feedback to the researchers. Patients in the in-home recovery phase are allowed to have family members present to provide assistance and support. 2) "Mindful breathing is a part of life, a home where life can settle. It allows one to find tranquility when facing illness and pain, to be present in the moment by focusing on the breath, and to live in unity of body and mind. Choose a comfortable posture, whether standing, sitting, or lying down. Settle yourself gently and close your eyes softly, or if you prefer, you can keep them open. Lower your gaze and softly focus on a point. Begin by feeling the sensation of your body standing, sitting, or lying down. Feel the crown of your head lifting gently as if pulled upward by a thread, allowing your spine to straighten slowly, and then gently relax your body. Maintain a comfortable posture and attentively feel each inhale and exhale. Now, explore which part of your body allows you to feel your breath the most. Is it the rise and fall of your abdomen? The expansion and contraction of your chest? Or the sensation of air entering your nostrils? Once found, place your attention there. Observe the breath, the sensations in your body as you inhale and exhale. If you notice any discomfort or irregularity in your breath, try adjusting it naturally without rushing to fit it into a specific pattern. Slowly shift your attention to other parts of your body, such as the soles of your feet. Whether your breath changes or not, approach it with acceptance, allowing the breath to occur freely. You may notice distractions arising, various thoughts flashing through your mind, or perhaps sounds disturbing you – this is normal. When you realize your mind has wandered, gently allow your attention to return to your breath, reconnecting with the sensation in your body".	"Under the guidance of the audio, practice mindfulness breathing for 10–15 min, 3–5 times per week, focusing on observing the experience of the present breath. Each practice, each breath, is different and unique. Simply observing and feeling it is enough. It is normal to become distracted during practice; simply encourage yourself to gently bring your attention back to the breath. Every distraction is an opportunity to cultivate your tolerance and patience".	4.429±0.737	0.166

		B6-2: Week 2	Being Kind to Yourself, Starting with Three Meals a Day - Mindful Eating	1) Invite patients to review the content of the previous session, share their experiences with practicing the homework, and address any questions or concerns they may have. 2) "Mindful eating involves focusing on the present moment while eating, paying attention to sensations and physiological responses, and mindfully experiencing the taste and texture of food, as well as sensing feedback from the body. By becoming aware of things in daily life and viewing each moment as fresh and new, even while facing illness, we can still cherish what we see, hear, and taste in the present moment. Choose a small piece of raisins, whether it is one you have tasted before or a new one. Find a comfortable sitting position and observe the chocolate's packaging. As you hold it in your hand, notice the color and design of the packaging. Slowly unwrap the chocolate. Pay attention to any changes in your body as your appetite is aroused. What sensations do you experience? What emotions do you feel? Try to resist the urge to eat the chocolate immediately; instead, inspect its integrity. What color do you see? How does it feel to touch? What does it smell like? Next, take a bite, but do not chew right away. Close your eyes and focus your attention on the chocolate on your tongue. How does it feel as it melts? Other than your mouth, how does your body react? Begin to chew the chocolate slowly. Notice its taste; is it the same as before? How is it different from when you first placed it on your tongue? What emotions and sensations do you experience? Then, swallow the chocolate and pay attention to how it feels as it goes down your throat. Is there an aftertaste on your tongue? How do you emotionally respond? Open your eyes and take some time to reflect on your physical and emotional sensations".	"Under the guidance of the audio, practice mindful eating for 10–15 min, 3–5 times per week, focusing your attention on the food itself and savoring its taste, texture, and other qualities. Mindful eating practice may pose initial challenges, but with time, the small daily changes will eventually lead to significant differences".	4.615±0.514	0.111
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Table I (Continued).

Indicator					Importance Score (Points, Mean ± Standard Deviation)	Coefficient of Variation	
		B6-3: Week 3	Embracing the Body, Entering Unconditional Love - Body Scan	1) Invite patients to review the content of the previous session, share their experiences with practicing the homework, and address any questions or concerns they may have. 2) “A body scan involves systematically scanning the body with the mind, bringing a kind, open, and curious attitude to focus on different areas of the body, developing a more intimate feeling with the body, and opening up to 'giving' and 'acceptance' in the interaction between sensation itself and our awareness of them, entering into unconditional care. Choose a comfortable posture and slowly bring your attention to your feet, imagining your awareness is like a soft light, starting from the toes, moving slowly upwards, passing through the soles, the tops of the feet, ankles, then to the shins, and slowly up to the thighs, feeling the sensations in the legs and feet. If it differs from what you expected, do not try to change it. Then let the soft light of awareness continue upwards, reaching the trunk area, from bottom to top, from the outside to the inside, passing through the hips, abdomen, back, chest, and then from the skin to reach the bones, muscles, and then the organs in the chest and abdomen. Slowly feel and encompass all sensations perceived. Next, feel the arms, letting your attention slowly move up through the entire palm, through the wrists, forearms, elbows, upper arms, to the shoulder and neck area. You may feel tightness or discomfort, but regardless of whether you like the feeling or not, observe it without trying to change it. Let the awareness come to the neck; feel if there is a swallowing impulse or dryness. Do not linger. Let the light of awareness come to your entire face and then the back of your head. Feel your chin, mouth, nose, cheeks, ears, eyes, forehead, and the entire back of the head. Experience what sensations exist in the entire head and face. You do not need to do anything, just experience and accept the sensations you have become aware of and relax in this gentle awareness. If you feel uncomfortable sensations or emotions when focusing on certain parts of the body, you can shift your attention to relatively neutral body sensations, such as your breath or the connection between your body and the ground. If you have no sense of appreciation or gratitude for the body during the practice, this is also a normal perception; accept it, allow it, and try to acknowledge it”.	“Under the guidance of the audio, practice body scan exercises for 10–15 min, 3–5 times per week, with an emphasis on developing a new appreciation and gratitude for your body. At any moment, if you feel uncomfortable, allow yourself to take care of yourself, even if it means interrupting the practice; this is also a part of caring for your body”.	4.857±0.414	0.085

		B6-4: Week 4	You Are Already Capable, No Need to Strain - Mindful Stretching	1) Invite patients to review the content of the previous session, share their experiences with practicing the homework, and address any questions or concerns they may have. 2) "Mindful stretching exercises teach us how to bring awareness to the sensations of the body while it is in motion. Stretching directly connects us with our bodies, and often emotions unconsciously manifest through the body. This helps in gently stretching and moving the body appropriately while enhancing awareness of the dynamic body. Gently explore and discover the possibilities and limitations of the body within awareness, noticing and experiencing the various subtle changes and impacts of movement. In a safe, comfortable, and uninterrupted space, choose a posture according to your own condition to do stretching exercises. Do not force or push yourself during the exercise; instead, accept the sensations of your body and embrace yourself in the present moment. Learn to be at peace with discomfort during stretching or balancing. When reaching limitations during stretching, practice staying in that limitation for a moment, feeling and accepting your current bodily sensations. If any discomfort or inconvenience arises in the body, allow yourself to stop. You can choose to skip certain movements or seek support and assistance from researchers or family members".	"Under the guidance of the audio, practice mindful stretching exercises for 10–15 min, 3–5 times per week, with an emphasis on gently exploring and discovering the potential and limitations of your body. During stretching, maintain a mindful attitude, continuously paying attention to your movements without rushing, pushing yourself beyond your limits, or criticizing yourself. Focus on the movements of your body and your breath, exploring the boundaries of your body".	4.286±0.724	0.169
		B6-5: Week 5	Living in the Present Moment, Settling Here - Mindful Sitting	1) Invite patients to review the content of the previous session, share their experiences with practicing the homework, and address any questions or concerns they may have. 2) "Mindfulness meditation is a practice that brings us back to our home, where we fully focus on ourselves and take care of ourselves. Find a comfortable posture, sit down quietly, slowly release the tension and stress from your body and sensations, enjoy your breath, let go of any struggles, and enjoy sitting with a smile. Sitting quietly is a very precious moment. In this moment, you are your own island; no one will disturb you, no one will ask you to do anything else, and no one has the right to ask you questions. Keep your waist and back naturally upright, relax your facial muscles, relax your shoulders, and let your arms hang naturally. Gently close your eyes, or naturally keep them open, stabilize your sitting posture, and maintain a sense of dignity. Remind yourself to let go of anything that may come to mind, let go of the past, let go of worries about the future, and invite yourself to fully enter the present moment, staying present. Focus on your breath, feeling each inhale and exhale truthfully, without needing to do anything else or think about anything else, just be with the sensation of your breath".	"Under the guidance of the audio, practice mindfulness meditation for 10–15 min, 3–5 times per week, focusing on simple breathing to observe your inner state and be aware of the changes within yourself and in your surroundings. Whatever arises within, we are present with it, not being carried away by it. Let it come, let it stay, and let it go, without pushing it away, resisting, or pretending that our thoughts do not exist".	4.643±0.507	0.109

(Continued)

Table 1 (Continued).

Indicator						Importance Score (Points, Mean $\pm$ Standard Deviation)	Coefficient of Variation
		B6-6: Week 6	Walking According to Your Heart, the Path Awaits You - Walking Meditation	1) Invite patients to review the content of the previous session, share their experiences with practicing the homework, and address any questions or concerns they may have. 2) "Walking meditation is a form of mindfulness that combines dynamic and static elements, focusing our awareness on our steps and synchronized breathing. It can be practiced at any pace, from very slow to gradually brisk. You can choose a sidewalk or walk along the corridors of the ward. Simply remind yourself to accept each moment as it comes. Start from a standing position with your feet slightly apart (they should be the same width as your hips) and distribute your weight evenly on both legs. Relax your body while maintaining an upright back. Lower your shoulders, keep your arms straight and soft, and relax your jaw. You should feel stable, fully comfortable, and relaxed. Imagine a gentle push on the top of your head towards the sky, helping to keep your back and neck straight. Direct your gaze down to a point about 2 meters in front of you without focusing on anything in particular. Relax all facial muscles, shoulders, and hips again. With each inhalation, lift one foot, and with each exhalation, take a half step forward, starting with the right foot so that the heel of your right foot is parallel to the toes of your left foot. Ensure that the heel and sole of your foot touch the ground before your toes. Become increasingly aware of the contact of your heel, sole, and toes with the floor/ground. All your attention and awareness are focused on your breath synchronized with the movement of your legs. Inhale through the nose. Lift one foot on the inhale and let it touch the ground on the exhale. Slowing down can help remind you that you are here, no matter where you are, aware that you are walking".	"Under the guidance of the audio, practice walking meditation for 10–15 min, 3–5 times per week, focusing on the slow movement of your legs and feet, staying in tune with your breath, and maintaining a steady and relaxed posture throughout the process. If you feel exhausted, sore all over, or physically uncomfortable, allow yourself to stop and engage in some activities to relax both body and mind".	5.000 $\pm$ 0.267	0.053

		B6-7: Week 7	Coexisting with Emotions, Gathering the Scattered Mind - Emotion Regulation	1) Invite patients to review the content of the previous session, share their experiences with practicing the homework, and address any questions or concerns they may have. 2) "Emotional regulation involves connecting mindfulness practice with the body to increase awareness, altering one's relationship with emotions, finding inner resources through self-care to enhance self-esteem and self-love, modifying cognitive patterns, establishing a connection with emotions, and achieving emotional stability. Find a comfortable posture, feel your current emotions and feelings, experience emotions without selectivity, face and accept your current thoughts and emotions, and try to coexist with your current mood rather than avoid it. Pay attention to the sensations in your body at this moment and feel the new emotions that arise with these sensations. Identify and label the thoughts or emotions you are experiencing; for example, saying 'Oh, the feeling rising within me right now is fear' is better than 'I am afraid.' You can also try using weather-related terms to describe your inner feelings, such as sunny, bright, cloudy, or overcast".	"Under the guidance of the audio, practice emotion regulation exercises for 10–15 min, 3–5 times per week, focusing on observing the connection between emotions and the body, and coexisting with emotions. The purpose of regulating emotions is not to eliminate or suppress them, but to change the way you interact with them, allowing for a more positive attitude towards accepting and dealing with emotions, reducing emotional fluctuations, and becoming the master of your emotions".	4.857±0.352	0.072
		B6-8: Week 8	Rebirth through Nirvana, Creating Infinite Possibilities - Mindful Living	1) Invite patients to review the content of the last session, share their experiences with practicing the homework, and address any questions or concerns they may have. 2) Encourage patients to internalize mindfulness practices and develop their own patterns. We encourage every research participant to narrate their experiences during the practice and how they apply mindfulness in their daily lives; to discuss any confusions encountered during each practice session, to free themselves from the constraints of avoidance reactions and to embrace confusions kindly rather than struggling with them. The 8-week course is a gateway to MBSR in life, but we continue to provide resources such as visual aids, audio files, and books to promote further practice for our participants. We can still share experiences, discuss issues, and encourage each other in the established WeChat group, facilitating mutual progress.	"Mindfulness is a journey of wonder, allowing us to continuously deepen our understanding of ourselves and reality, gaining insights into life that can only be obtained through diligent practice. Learning mindfulness and living mindfully enables life to create infinite possibilities".	4.643±0.507	0.109

section, the response rates of 100% for both consultation rounds indicated that the experts were actively engaged in each survey. Regarding the professionalism of the experts, the authority coefficients were 0.846 and 0.875 in the first and second rounds, respectively. Given that other studies typically use 0.7 as the threshold,²⁸ the coefficients in the present study demonstrate that the experts had a higher level of authority in terms of self-assessment. Additionally, the convergence of expert views and the increasing degree of harmonization were observed during the two rounds of expert consultations.

Specificity of MBSR Therapy Program for HM Patients

Malignant hematologic diseases comprise a group of malignant clonal disorders originating from the bone marrow, lymphoid tissue, and blood, including various types of leukemia, lymphoma, and myelodysplastic syndromes.²⁹ Because these diseases are highly malignant, they are challenging to treat and pose dual challenges to both the physical and mental health of patients. Previous studies have shown that psychological support and intervention have a positive impact on the mental health and quality of life of patients.³⁰ However, challenges persist in the provision of psychological intervention for patients with HM, and more effective and comprehensive approaches are needed to help patients cope with the physical and mental distresses caused by these diseases. The 8-week intervention program proposed in this study is rooted in MBSR and customized to suit the characteristics and physical condition of patients with HM, thus ensuring a highly specific approach to MBSR for this patient population. The program is designed to progress gradually, starting from simple exercises and advancing to more complex ones, transitioning from static to dynamic movements and incorporating a combination of both. It evolves from lying to sitting to standing to stretching, gradually guiding patients towards embracing life fully while establishing mindfulness both physically and psychologically. Safety is prioritized throughout the intervention, with medical staff accompanying patients during mindfulness exercises. Patients are encouraged to rest or discontinue exercises if they experience any discomfort. Particularly in the “Mindful Stretching” component, patients are not pressured to perform exercises beyond their capabilities; instead, they are encouraged to acknowledge and accept their body’s sensations in each moment. When engaging in stretching or balancing exercises, patients learn to peacefully coexist with any discomfort they may experience.

Strengths and Innovations

The strengths and innovations of this project are primarily manifested in the following aspects. The first is personalization and integration: the MBSR treatment plan developed in this study fully considers the special needs and challenges of patients with malignant hematologic diseases. It integrates various elements such as mindfulness meditation, cognitive-behavioral strategies, and physical stretching in a progressive and comprehensive manner. This holistic approach, ranging from static to dynamic exercises and from lying down to sitting to standing positions, aims to enhance patients’ psychological health and quality of life comprehensively. The second aspect related to self-management and coping skills: MBSR therapy emphasizes cultivating patients’ acceptance and awareness of their current situation as well as their ability to effectively cope with stress and emotions. By learning mindfulness techniques, patients can better cope with the discomfort and challenges they experience during treatment, enhancing their self-management and self-regulation abilities. This self-management ability not only helps alleviate patients’ psychological pressure but also enhances their adaptation to the disease, improving treatment outcomes. A third aspect is physiological and immune regulation: in addition to its positive effects on psychological health, MBSR therapy has been shown to regulate physiological and immune functions to some extent. This is particularly important for patients with HM, as it can help them better cope with treatment side effects and enhance their physical resistance. Through mindfulness practice, patients can regulate physiological responses to reduce physical discomfort and strengthen their immune system, thereby reducing the economic burden on patients and helping them to better cope with the impact of the disease. An important fourth aspect is the program’s practicality and generalizability: MBSR therapy is worth promoting due to its simplicity, environmental friendliness, wide applicability, and good clinical outcomes. Additionally, the intervention protocol developed in this study specifically for patients with HM further enriches the content of MBSR therapy, making it more practical.

While this study focused on psychological outcomes (anxiety, depression, sleep quality), future research should explore the potential impact of this MBSR program on long-term clinical outcomes, such as overall survival (OS) and

disease-free survival (DFS). Preliminary evidence in other cancer populations suggests mindfulness interventions may indirectly influence survival through improved treatment adherence and immune modulation, but further randomized controlled trials (RCTs) in HM patients are needed to validate these associations.

Conclusion

Through a comprehensive literature search and two rounds of expert consultations, an MBSR therapy program was devised specifically for patients with HM, comprising 2 primary items, 9 secondary items, and 27 tertiary items. The program demonstrated scientific reliability, specificity to HM patients' needs, and practical innovation. Next, we will conduct a randomized controlled trial to evaluate its efficacy in improving psychological outcomes (anxiety, depression) and explore potential impacts on clinical outcomes such as treatment adherence and quality of life. Limitations of this study include potential selection bias in expert recruitment (focused on Beijing tertiary hospitals) and the need for multi-center validation to enhance generalizability. This program provides a standardized framework for integrating mindfulness-based interventions into clinical and psychosocial oncology care for HM patients in China.

Data Sharing Statement

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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Disclosure

The authors have no conflicts of interest to disclose.

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