

RESEARCH

Efficacy of mindfulness-based stress reduction programme in reducing perceived stress and health complaints in patients with coronary heart disease

Dharmender Kumar Nehra, NovRattan Sharma¹, Pradeep Kumar², Sheetal Nehra³

Clinical Psychologist, State Institute of Mental Health (SIMH), Post Graduate Institute of Medical Sciences (PGIMS),

¹Professor, Department of Psychology, Maharshi Dayanand University (MDU),

²Psychiatric Social Worker, SIMH, PGIMS,

³Department of Psychology, MDU, Rohtak, Haryana, India

Abstract

Background: Coronary heart diseases (CHD) represent a major health burden. The number of patients with CHD is increasing and psychosocial factors are now recognised as playing a significant and independent role in the development of CHD and its complications. This indicates a need for implication of non-pharmacological intervention in the management of CHD patients, which is overlooked in Indian settings.

Aims: The present study aimed at examining the efficacy of mindfulness-based stress reduction (MBSR) programme in reducing the perceived stress and health complaints (somatic complaints and cognitive complaints) in CHD patients.

Methodology: The sample consisted of 50 participants with the diagnosis of CHD; age ranged from 25 to 55 years. Participants were randomly assigned into two groups – treatment-as-usual (TAU) group (N=25) and MBSR group (N=25) – after completing the measures. The tools used, before and after intervention, included Perceived Stress Scale (PSS) and Health Complaints Scale (HCS). Statistical analysis was done using Statistical Product and Service Solutions version 16.0 (SPSS-16.0).

Results: The results revealed a significant decrease in perceived stress and health complaints scores in the MBSR group at post intervention level.

Conclusion: MBSR is highly effective for reducing perceived stress and health complaints in CHD patients. These findings should be considered as a breakthrough and can be taken seriously that MBSR is a credible and potentially effective way of helping people cope with perceived stress and health complaints.

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Correspondence: dknehra@yahoo.com

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Introduction

Coronary heart disease (CHD) is the leading cause of death worldwide;[1] its growing prevalence contributes significantly to both a health and economic burden. Lifestyles of population across the world have changed dramatically in the 20th century. Combined with increasing tobacco use, these changes have fuelled the epidemic of CHD.[2] India is undergoing a rapid health transition with rising problem of CHD.[3] The incidence of CHD continues to increase vividly; it is forecast to be the most common cause of death globally, including India, by 2020.[4] As a general consensus, emergence of CHD is an assault on the mental health and well-being of the sufferer and their families, which disrupt normal life and instill worry and apprehension. A patient's stress or anxiety can be the natural

consequence of advance of a life threatening disease.[5] Over the last years, a great deal of research effort has been directed towards identification of psychosocial risk factors associated with CHD.[5,6] The results from the INTERHEART study conclusively established the role of behavioural and conventional risk factors in the prediction of CHD risk among Indians.[7] Psychosocial risk factors are highly prevalent in CHD patients[5] but are often under-recognised, underdiagnosed, and undertreated. Reasons for this deficiency include a lack of awareness and management of these psychological consequences of CHD which is a pressing public health issue. Rapid advancement in the understanding of the interaction between emergence of medical condition and psychological problems demonstrated that psychosocial factors contribute significantly to the

pathogenesis of CHD.[8] It is becoming gradually clear that medical care can be improved by paying more attention to psychological aspects of medical condition.[9] Furthermore, early identification and appropriate treatment of psychological problems in medically ill can positively influence medical outcome and quality of life (QOL).[9] Sreevani and Reddemma[10] suggested the need to consider not only symptom severity, but also functional impairment and QOL measures in the assessment and treatment. An enlarging body of evidence also supports that CHD is a condition that requires adherence to a complex behavioural regimen, and regimen adherence is essential for minimising the risk of debilitating consequences. The emotional consequences of emergence of CHD (which can include distress, anxiety, depression, anger, etc.) pose unique challenges for professionals charged with intervention planning.[5]. To be more specific, psychological problems such as stress and health complaints (somatic as well as cognitive) can prevent a person to follow the essential regimen. Moreover, side effects of psychiatric medications can pose a challenge, making it hard to differentiate from symptoms of somatic illness, which may lead to diagnostic issues.[9] This scientific knowledge places heavy demands on clinical researchers for thoughtful application of non-pharmacological means to decrease stress that ultimately lead to improved QOL and treatment adherence. So, there is an urgent need to start genuine attempts to move away from a simple linear model of health and look at the combination of factors involved in illness such as biological, psychological, and social, particularly in CHD population.[5]

Previous research advocated that it is crucial to recognise risk factors and use of non-pharmacological interventions for management of these psychological risk factors.[5,11,12]. There is substantial evidence that mindfulness-based stress reduction (MBSR) programme improves mental and physical health compared to wait-list controls and treatment-as-usual (TAU), and is of comparable efficacy to other psychological interventions.[13-16]. The body of evidence indicates a positive effect by MBSR on the physical and mental symptoms which promises an effective treatment for those patients suffering from CHD.[12] Despite strong evidence on the efficacy of MBSR for psychiatric and physical disorders, notably less studies has been conducted in Indian settings. This study gathered statistical evidence of MBSR programme on the health benefits (reducing stress and health complaints) of CHD patients who had survived from a serious illness.

Aims and objectives: Aim of the study was to assess the efficacy of MBSR programme in the management of

perceived stress and health complaints in patients with CHD.

Material and methods

The sample consisted of 50 participants who were suffering from CHD diagnosed by cardiologist. Using the random table numbers, CHD patients were further randomly assigned to two groups - MBSR group and control group/TAU; each group comprising of 25 patients. Patient inclusion criteria were age at most 55 years, discharged from hospital after a myocardial infarction (MI) or angina pectoris (AP), living in Haryana, referred back to the general practitioner, and not having previously participated in similar programmes, being Hindi/English speaking, and being willing to participate in the study. The study group was matched to the control group by age, sex, and place of living.

Tools used

Case history proforma: This was developed to obtain information on demographic, clinical, personal and family details.

Perceived Stress Scale:[17] The Perceived Stress Scale (PSS) is an economical and simple psychological instrument to administer, comprehend, and score. It measures the degree to which situations in one's life over the past month are appraised as stressful. Items were designed to detect how unpredictable, uncontrollable, and overloaded respondents find their lives. Respondents report the prevalence of an item on a five-point scale, ranging from never to very often. Higher scores indicate more stress.

Health Complaints Scale:[18] Health complaints were assessed with the Health Complaints Scale (HCS), a self-report measure to assess common health complaints in patients with CHD. It is a measure of self-reported health complaints in CHD population. It measures somatic and cognitive complaints. Somatic complaints focused on symptom clusters of cardiopulmonary, fatigue and sleep problems, and the cognitive complaints focused on the symptom clusters of "health worry" and "illness disruption". It comprises of 24 items – 12 pertaining to somatic complaints and 12 pertaining to cognitive complaints. Both these scales have a high internal consistency, adequate test retest reliability, and good construct validity. The responses are rated on a five-point scale. The range of the scores is zero to 48 for the somatic scale and cognitive scale, and zero to 96 for the total scale.

Data analysis: Data was analysed using Statistical Product and Service Solutions version 16.0 (SPSS-16.0). Student's t test was used to obtain p value. To account for the tests performed, p values <0.05 were considered to indicate significant statistical difference.

Procedure: Protocol of the study was presented to and approved by Research Committee of Maharshi Dayanand University, Rohtak, Haryana. All patients fulfilling the inclusion criteria were informed about the study and a written consent was also taken from those who accepted the invitation and eventually included. Data collection for the study was done between the periods of December 2008 to January 2010. Following this, information on socio-demographic datasheet was taken and pre-assessment was done. Following the assessment, the patients were randomly allotted to experimental group (MBSR) and control group (TAU); thus there were 25 patients in each group. There were no significant age or diagnosis differences between MBSR group and TAU group. In addition, with the groups, one session of coronary counselling with patients and one session of behavioural counselling to significant others were carried out after the pre-assessment. No other sessions were held with TAU group till post-assessment. Post-assessment was carried out ten to 17 weeks after the pre-assessment and education session (with TAU group) or at completion of interventions (with MBSR group). Both the patient groups were taking their medical treatment during the study period as usual.

Details of therapeutic procedures: MBSR (formerly known as the stress reduction and relaxation programme) is a standardised meditation programme developed by Kabat-Zinn in 1979, from the effort to integrate Buddhist mindfulness meditation with contemporary clinical and psychological practice.[15,19]. It was originally developed to relieve suffering among patient with chronic pain and to facilitate adaptation to medical illness, that provides systematic training in mindfulness meditations, a self-regulation approach to stress reduction and emotion management.[20] MBSR is a structured group programme, though there are examples where it was administered in individual settings.[11,21] Presently, MBSR as an intensive structured training in mindfulness meditation has proved its efficacy in different population in different parts of the world. Cohen-Katz *et al.*[22] have described the procedure of MBSR programme briefly in following lines, “The

MBSR is taught as an eight-week program that meets approximately 2.5 hours a week and includes a six-hour daylong retreat between the sixth and seventh weeks. Participants are asked to practice the mindfulness techniques six days a week as “homework”, and given audiotapes to facilitate this. Sessions include a combination of formal didactic instruction on topics such as communication skills, stress reactivity, and self-compassion, and experiential exercises to help participants integrate these concepts”. Participants commit themselves to spend at least 45 minutes daily, six days a week, conducting MBSR exercises during the training period. MBSR utilises stress-reduction skills including sitting meditation, hatha yoga, and a somatically focused technique called the body scan.[20] Kabat-Zinn[15] explains that the purpose of the eight-week programme is to teach participants how to ‘pay attention in a particular way: on purpose, in the present moment, and non-judgmentally’. By learning to cultivate present-moment awareness, practitioners are described as becoming more mindful of their thoughts, emotions, sensations and overall sense of self. The approach assumes that greater awareness will provide more veridical perception, reduce negative affect, and improve vitality and coping.[23] The MBSR programme recommends using meditation, yoga, relaxation training, as well as strategies to incorporate these practices into everyday life. A range of other mindfulness meditation techniques are taught: awareness of breathing, mindful walking, mindful eating, and mindful communication. In all of these practices, the participant trains to pay full attention to present-moment experience, choosing to respond skillfully rather than react automatically to external events, thoughts, emotions, or sensations as they arise.[24]

In present study, MBSR programme was based on “Full catastrophe living: using the wisdom of your body and mind to face stress, pain, and illness” by Kabat-Zinn[15] and “Mindfulness-based cognitive therapy for depression: a new approach to preventing relapse” by Segal *et al.*[25] The MBSR programme was completed in ten to 17 sessions; the extended sessions can be explained on account of the modification (combination of MBSR and mindfulness-based

Table 1. Summary of t-test for control (TAU) group and MBSR group on Perceived Stress Scale (PSS), Cognitive Health Complaints (CHC) and Somatic Health Complaints (SHC), pre-intervention

	Groups	N	Mean	SD	Df	t value	p value
PSS	TAU	25	13.8800	3.96148	48	-.286	0.77 (NS)
	MBSR	25	14.1600	2.88213			
CHC	TAU	25	19.9600	10.15497	48	.115	0.90 (NS)
	MBSR	25	19.6400	9.50824			
SHC	TAU	25	19.4800	10.94349	48	-.013	0.98 (NS)
	MBSR	25	19.5200	10.40481			

cognitive therapy [MBCT]) in our programme, this combination has also been used earlier in Indian setting.[11]

Result

The analysis of the data and the results are as tabulated.

It can be seen from the tables and figure that the both the groups are comparable on perceived stress and health complaints measure at pre-intervention assessment with having high score, whereas the comparison of post-intervention assessment scores shows that the scores of the MBSR group decreased significantly as compared to that of control (TAU) group.

Discussion

MBSR is a psychological intervention[26] that has shown consistent efficacy in improving participants' physical and mental health.[15,27-30] The results of present study demonstrate significantly decreased perceived stress and reduction in physical and cognitive health complaints in patient population following MBSR programme. The improvement in the study group in present study can be attributed to the MBSR programme itself that contain several potentially therapeutic elements, as this programme is designed to teach patients with chronic medical conditions how to live fuller, healthier, more adaptive lives.[15]

Shapiro *et al.*[31] theorised that mindfulness practice would provide training in how to shift one's perspective so that thoughts and experiences could be viewed more objectively. Furthermore, participants start viewing thoughts as being passing mental events as opposed to being true reflections of reality.[32]

Present study revealed that MBSR is able to reduce perceived stress. It can be understood in the light of Kabat-Zinn's statement that automatic reactions, triggered out of unawareness, usually compound and exacerbate stress, making what might have remained basically simple problems into worse ones. They prevent one from seeing

Table 2. Summary of t-test for control (TAU) group and MBSR group on Perceived Stress Scale (PSS), Cognitive Health Complaints (CHC) and Somatic Health Complaints (SHC), post-intervention

	Groups	N	Mean	SD	df	t value	p value
PSS	TAU	25	12.96	3.195	48	2.479	0.01 (S)
	MBSR	25	11.00	2.327			
CHC	TAU	25	17.60	7.958	48	2.307	0.02 (S)
	MBSR	25	13.24	5.093			
SHC	TAU	25	18.00	9.574	48	2.324	0.02 (S)
	MBSR	25	12.88	5.449			

Table 3. Summary of t-test for control (TAU) group and MBSR group on Perceived Stress Scale (PSS), Cognitive Health Complaints (CHC) and Somatic Health Complaints (SHC), pre- and post-intervention

	Groups	N	Mean	SD	Df	t value	p value
PSS	TAU pre-intervention	25	13.8800	3.96148	24	1.342	0.19 (NS)
	TAU post-intervention	25	12.9600	3.19479			
	MBSR pre-intervention	25	14.1600	2.88213	24	3.995	0.00 (S)
	MBSR post-intervention	25	11.0000	2.32737			
CHC	TAU pre-intervention	25	19.9600	10.15497	24	1.341	0.19 (NS)
	TAU post-intervention	25	17.6000	7.95822			
	MBSR pre-intervention	25	19.6400	9.50824	24	2.947	0.00 (S)
	MBSR post-intervention	25	13.2400	5.09313			
SHC	TAU pre-intervention	25	19.4800	10.94349	24	1.602	0.12 (NS)
	TAU post-intervention	25	18.0000	9.57427			
	MBSR pre-intervention	25	19.5200	10.40481	24	2.878	0.00 (S)
	MBSR post-intervention	25	12.8800	5.44916			

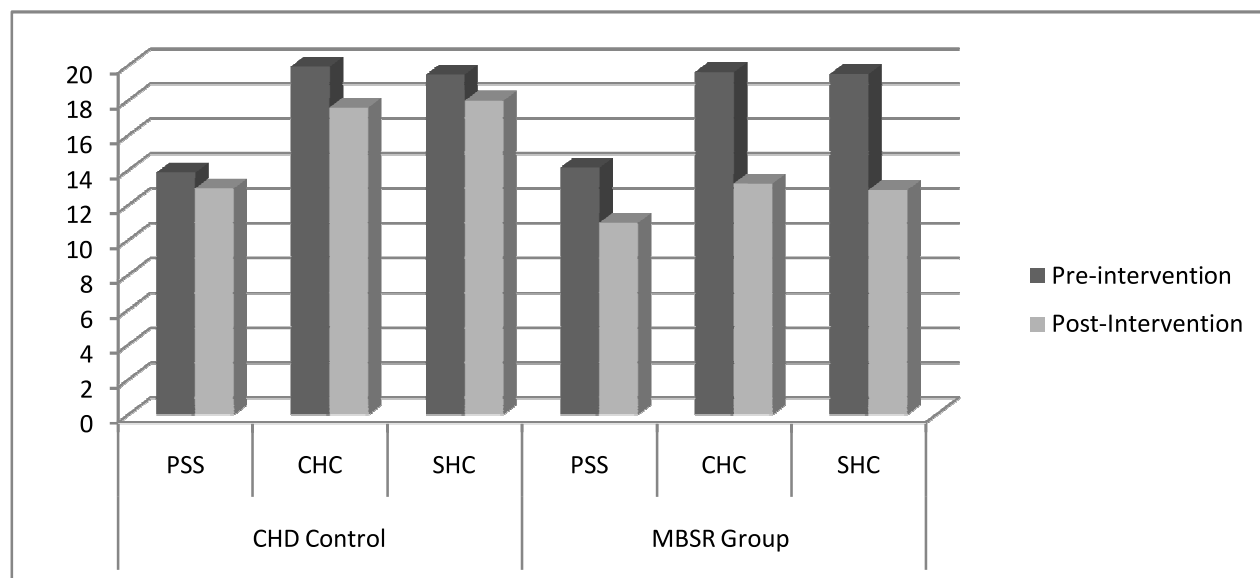


Figure 1 The mean scores of both groups on Perceived Stress Scale (PSS), Cognitive Health Complaints (CHC) and Somatic Health Complaints (SHC).

clearly, from solving problems creatively, from expressing emotions effectively when one needs to communicate with other people, and ultimately they prevent from attaining peace of mind.[15] MBSR focuses on the progressive acquisition of mindfulness (awareness); this approach is based on the principle that greater awareness will increase perception and insight, improve self-efficacy and control, reduce negative affect and provide a more differentiated picture of wellness in which stress and ailments play natural roles while still allowing for an improved QOL.[15] By having individuals focus their awareness on emotional symptoms in a nonjudgemental manner, mindfulness can help to prevent avoidance or escape. When individuals fully experience their feared emotional symptoms, they can properly observe the consequences of their emotional symptoms and formulate more effective coping strategies. In addition, the slow and deep breathing involved in mindfulness meditation may alleviate bodily symptoms of distress by balancing sympathetic and parasympathetic responses.[19] Moreover, findings from some studies indicate that MBSR can alter the function of the brain that is responsible for affect regulation and the areas that govern how one react to stressful impulses, and this in turn may normalise body functions such as breathing, heart rate and immune function.[33,34] Therefore, it can be said for sure that MBSR programme reduce perceived stress in CHD population.

In line with previous studies examining the efficacy of mindfulness for treating distress associated with CHD,[23] the present study also showed that MBSR improved somatic and cognitive health problems. The improvement can be attributed to the reported benefits of mindfulness training in previous studies including an increased ability to relax, improve mood, enhance self-awareness and self-worth, improve sleep and new ways of working with negative

thoughts and emotions after going through mindfulness based interventions.[35] When looking at physical pain tolerance tasks, there are a number of studies to support that using acceptance strategies lead to increased pain tolerance[36] compared to more control-based strategies. As per Kabat-Zinn,[15] mind has the tendency to categorise everything into good, bad and neutral, so it is plausible that one rushed to good and rushed away from bad or in other words person becomes over distressed, on the face of any catastrophe (emergence of any life threatening disease) and traps in thoughts/behaviours that increased stress.[37] While mindful meditation requires that when one finds the mind judging, one don't have to stop it from doing that rather to be aware of it happening and accept it. Acceptance means actively responding to feelings by allowing or letting be before rushing in and trying to fix or change them.[25] In other words, present findings can also be understood in the light of attitudinal factor of mindfulness treatments that strongly emphasise acceptance of symptoms rather than avoidance or suppression of symptoms[38] as MBSR is strongly rooted in the belief that with increased acceptance, one can experience greater psychological health.[37]

Conclusion

The finding that CHD is related to different psychiatric traits and conditions is, of course, not surprising. World literature supports that high proportion of people with CHD meet criteria for psychological problems in relation to the emergence of CHD. Studies measuring psychological problems conclude that stress symptoms are a prevalent problem in CHD patients. It is generally acknowledged that comorbid psychological problems with medical illnesses are much more difficult to detect when masked by somatic complaints. Therefore such patients' psychological problems are less likely to be recognised and treated. MBSR

training does appear to confer reliable benefits for patients with CHD and can be recommended for clinical practice. In present study, it was found that all the three variables: perceived stress, cognitive health complaints, and somatic health complaints are preponderant in patients suffering from CHD at pre-intervention level and reduced significantly post-intervention level. These results confirm and strengthen the findings of past research signifying that participation in MBSR programme can have positive benefits for stress symptoms and health complaints. This study has also shown that MBSR can be an effective adjunct to medical care. The use of MBSR thus adds to a comprehensive system of care; based on outcomes of present study, we are advocating the use of MBSR programme for CHD patients.

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