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Distress Reduction for Palliative Care Patients and Families With 5-Minute Mindful Breathing: A Pilot Study

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Abstract

A pilot study was conducted to evaluate the efficacy of 5-minute mindful breathing in distress reduction. Twenty palliative care patients and family caregivers with a distress score ≥ 4 measured by the Distress Thermometer were recruited and randomly assigned to mindful breathing or "listening" (being listened to). Median distress reductions after 5 minutes were 2.5 for the mindful breathing group and 1.0 for the listening group. A significantly larger reduction in the distress score was observed in the mindful breathing group (Mann-Whitney *U* test: $U = 8.0$, $n_1 = n_2 = 10$, mean $rank_1 = 6.30$, mean $rank_2 = 14.70$, $z = -3.208$, $P = .001$). The 5-minute mindful breathing could be useful in distress reduction in palliative care.

Keywords

distress, suffering, mindfulness, mindful breathing, psychosocial care, palliative care

Introduction

According to the Transactional Model of Stress and Coping, stress is a transaction between a person and a situation. The transaction is in the form of appraisals in which the relative significance of the situation as a threat is judged and the capacity of the person to cope with the situation is evaluated.[1] These appraisals are major determinants of stress. Stress itself could be appraised as good or bad. Good stress, or eustress, is stress that is appraised as a challenge that may enhance growth or functioning. On the other hand, bad stress, or distress, is persistent stress that is not resolved through coping or adaptation.[2-4]

The National Comprehensive Cancer Network (NCCN) defines distress as a multifactorial unpleasant emotional experience of a psychological, social, and/or spiritual nature that may interfere with the ability to cope effectively with cancer, its physical symptoms, and its treatment.[5] It extends along a continuum of experiences ranging from normal feelings of vulnerability, sadness, and fears to problems that can become disabling, such as depression, anxiety, panic, social isolation, existential, and spiritual crises.[5] In view of the importance in recognizing distress among patients with cancer, emotional distress has been officially endorsed as a sixth vital sign in many cancer care settings.[6]

In dealing with psychosocial distress, psychosocial interventions, such as supportive psychotherapy, cognitive-behavioral therapy, crisis interventions, group therapy, and problem-solving techniques, have been found to be useful in reducing distress among patients with cancer.[7] Mindfulness-based interventions, such as mindfulness-based stress reduction and mindfulness-based cognitive therapy, are additional promising approaches in distress reduction for patients with cancer and family caregivers.[8-12]

Mindfulness is paying attention in a particular way: on purpose, in the present moment and nonjudgmentally.[13] The practice of mindfulness leads to stress reduction through several mechanisms: (1) paying attention on purpose interrupts automatic negative thoughts; (2) paying attention in the present moment reduces rumination and worries; and (3) paying attention nonjudgmentally minimizes negative appraisals of the

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situation. Mindfulness allows a person to cultivate noninterference with experiences by allowing inputs to enter awareness in a simple noticing of what is taking place.[14]

Although mindfulness-based interventions are useful in reducing various forms of psychological stress, its application in the palliative care settings is not without its challenges. First, the intention and determination of terminally ill patients to break the long-standing habitual reactions to stressful situations may not be present. Second, the attention span of dying patients may be limited. Finally, the energy of patients to participate in regular stress reduction sessions may be lacking. Hence, a 5-minute mindful breathing was proposed to address the above-mentioned challenges. This 5-minute mindful breathing is based on a series of mini-mindfulness practices developed specifically for terminally ill patients. From a variety of mini-mindfulness practices, mindful breathing was chosen for the study because it represents a core practice that serves to anchor the other mindful practices.[15] The aim of the study was to assess whether mindful breathing is useful in distress reduction for palliative care patients and family caregivers.

Table 1. Techniques of 5-Minute Mindful Breathing Versus Listening.

Techniques	
5-Minute Mindful Breathing	Listening
Instructions	Semistructured questions
Make yourself comfortable.	Please tell me about your illness (patients)/caregiving experience (family members).
Relax your body.	
Close your eyes gently.	
Take two deep breaths slowly.	Please tell me about yourself.
Then, breathe naturally.	Please tell me about your life.
Notice the flow of air through your nose.	Please tell me about your family and friends.
Rest your attention gently on the breath.	Please tell me about things that are important to you.
If you are distracted by any sounds, body sensations, thoughts or feelings, gently come back to your breath.	
Be aware of the breath for the next five minutes.	

Methods

We conducted a brief, parallel-group, nonblinded, and randomized controlled pilot study from January 10, 2014, to February 14, 2014. We included patients and family caregivers, 18 years of age and older, who were under the care of the palliative care team at the University Malaya Medical Centre, a tertiary hospital in Kuala Lumpur, Malaysia. They were adult palliative care inpatients who were admitted to our 12-bedded palliative care ward and their attending family caregivers. Twenty patients and family caregivers who demonstrated moderate to severe distress with a score of 4 or above as assessed with the Distress Thermometer were recruited.[5,16]

The study was conducted in accordance with the Declaration of Helsinki. Approval was obtained from the Medical Ethics Committee of University Malaya Medical Centre and all participants provided written informed consent.

Before inclusion, eligible patients and caregivers were interviewed by a palliative care physician to confirm the diagnosis of moderate to severe distress (distress score $\geq$4) using the Distress Thermometer.[5,16] Participants were excluded if they were noncommunicative, deemed confused as defined by the Confusion Assessment Method or having reduced conscious level according to the Glasgow Coma Scale.[17] Participants were randomly assigned to either mindful breathing or "listening" (being listened to). A computer-generated table of random numbers with block of 20 was prepared. The allocation ratio was 1:1.

Participants allocated to the mindful breathing group received a 5-minute mindful breathing session guided by a palliative care physician. These participants were instructed to relax their body, close their eyes, and focus their attention on their breathing. If they noticed any distractions, such as sounds, body sensations, thoughts, or feelings, they were told to gently redirect their attention back to their breathing. They were told to focus their attention on their breathing for 5 minutes, and the palliative care physician sat and practiced mindful breathing together with the participants during the 5 minutes.

Participants allocated to the control group received a 5-minute "listening" session with the same palliative care physician. These participants were interviewed with open-ended questions regarding their experiences of illness for patients and experiences of caregiving for family members. After completing the 5-minute listening session, the participants were facilitated to continue talking and they were listened to for a further 15 minutes as we believed that listening to them for 5 minutes might not be adequate for distress reduction. The instructions to conduct the mindful breathing session and the listening session were presented in Table 1.

Outcomes were assessed by the same palliative care physician at minute 0 (baseline) and at minute 5 for both groups, and at minute 20 for the listening group. The primary outcome was the change in distress score at minute 5, as measured by the Distress Thermometer.[5,16] Secondary outcomes were the change in distress score *during* the 5-minute session as recollected by the participants and the change in distress score at minute 20 for the listening group.

The Distress Thermometer is a validated rapid screening tool for distress and has been endorsed by the NCCN Distress Management Guidelines panel. It serves as an initial single-item question screen, which identifies distress from any sources. The word "distress" was chosen because it sounds "normal" and is less embarrassing to patients. It assesses how much distress patients are going through in the past week from a scale of 0 to 10.[5]

The analyses were carried out using SPSS version 20.0. All patients were included in the analyses. To compare the change in distress score between the mindful breathing group and the listening group, Mann-Whitney *U* tests were performed. In the primary analysis, we compared the change in distress score at

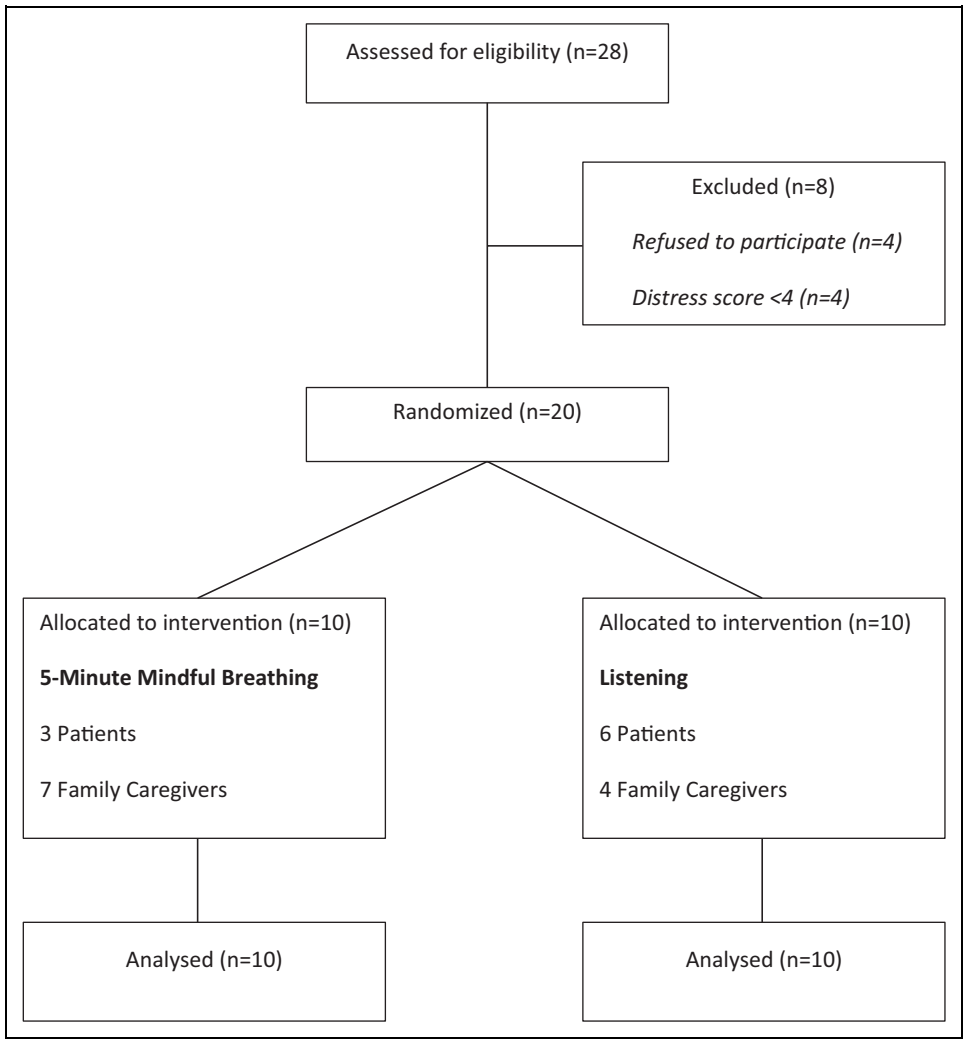

Figure 1. Flow of participants through study protocol.

minute 5 between the intervention and the control groups. For secondary analyses, first, we compared the change in distress score *during* the 5-minute sessions based on participants recollection between the intervention and the control groups; second, we compared the change in distress score between the intervention group at minute 5 and the control group at minute 20.

Results

Of the 28 patients approached and screened, 4 refused to participate and 4 were excluded because of a low distress score <4. A total of 20 participants with a distress score ≥4, which consisted of 9 patients and 11 attending family caregivers, were randomly assigned to either a 5-minute mindful breathing session or a 5-minute listening session. The flow of participants through the study protocol is illustrated in Figure 1. Table 2 shows the demographic characteristics of these participants.

All 20 participants completed the study and were included in the analysis. The median distress scores at baseline were 6.0 in both groups. *During* the 5-minute sessions, the median distress scores decreased to 0 in the mindful breathing group and 5.0 in the listening group. At minute 5, the median distress score increased to 3.5 in the mindful breathing group and maintained at 5.0 in the listening group. At minute 20, the median distress score decreased to 3.5 in the listening group. These results are shown in Table 3.

Primary Analysis

The median distress reduction at minute 5 was 2.5 for the mindful breathing group and 1.0 for the listening group (Table 4). The estimated difference in median distress reduction was 1.5. Based on Mann-Whitney U test, distress reduction differed significantly between the 2 groups at minute 5 ($U = 8.0$, $n_1 = n_2 = 10$, mean $\text{rank}_1 = 6.30$, mean $\text{rank}_2 = 14.70$, $z = -3.208$, $P = .001$ 2-tailed).

Secondary Analyses

The median distress reduction *during* the 5-minute mindful breathing sessions was 6.0 and *during* the 5-minute listening sessions was 1.0. The estimated difference in median distress reduction was 5.0. Based on Mann-Whitney U test, distress

Table 2. Demographic Characteristics.

Characteristics	Techniques	
	5-Minute Mindful Breathing	Listening
Total number	10	10
Profile		
Patient	3	6
Family caregiver	7	4
Mean age (SD)	47 (17.23)	54 (12.21)
Gender		
Male	3	1
Female	7	9
Marital status		
Single	3	3
Married	6	6
Widowed	1	1
Religion		
Islam	2	2
Buddhism	4	4
Christianity	0	2
Hinduism	4	2
ECOG (patients)		
2	1	0
3	0	5
4	2	1

Abbreviations: ECOG, Eastern Cooperative Oncology Group Performance Status; SD, standard deviation.

Table 3. Description of Distress Score.

	Distress Score	
	5-Minute Mindful Breathing, Median (Interquartile Range)	Listening, Median (Interquartile Range)
Minute 0	6.0 (5.00)	6.0 (2.00)
During[a]	0.0 (4.88)	5.0 (3.25)
Minute 5	3.5 (3.63)	5.0 (3.25)
Minute 20 (for listening only)		3.5 (2.00)

[a]During the 5-minute session.

reduction differed significantly between the 2 groups during the 5-minute sessions ($U = 1.0$, $n_1 = n_2 = 10$, mean $rank_1 = 5.60$, mean $rank_2 = 15.40$, $z = -3.773$, $P = .0001$ 2-tailed).

Comparing different intervals, both 5-minute mindful breathing and 20-minute listening achieved a median distress reduction of 2.5. Based on Mann-Whitney U test, there was no significant difference in distress reduction between 5-minute mindful breathing and 20-minute listening ($U = 29.5$, $n_1 = n_2 = 10$, mean $rank_1 = 8.45$, mean $rank_2 = 12.55$, $z = -1.593$, $P = .111$ 2-tailed).

Discussion

This is the first randomized controlled pilot study of 5-minute mindful breathing. It demonstrates that 5-minute mindful breathing reduces distress of palliative care patients and their attending family caregivers. The rapid onset of therapeutic action is of major benefit in clinical practice, particularly in terminally ill patients with a limited life expectancy and their attending family caregivers. Comparing the durations of various psychosocial interventions in palliative care, 5-minute mindful breathing is the shortest.[18-21] Apart from the rapid onset of action, 5-minute mindful breathing is also easy to administer. It can be administered by any health-care providers without needing to go through any specific training. The instructions for the practice are clear and simple, as shown in Table 1.

The reduction in distress was greater during the mindful breathing session than after the session. This could be explained by the fact that focused attention on breathing reduced the attention on distress. When the attention on breathing was stopped after 5 minutes, attention returned to distress again. Therefore, multiple sessions of 5-minute mindful breathing may be needed to produce a more sustained effect. Patients and caregivers could continue to practice mindful breathing after the initial guidance from the health-care provider. A taped version of the exercise could be offered to patients and caregivers so that they could apply it on their own. For those who are not able to pay attention, those who are not motivated, and those who have the tendency to revisit their distressing experiences, practicing mindful breathing could be a challenge.

Although listening is a form of treatment for psychoexistential suffering, our results showed that 5 minutes of listening was inadequate in distress reduction.[22-25] The results were not surprising. Patients and caregivers need time to narrate their experiences. The more distressed they are, the more time they may need. Furthermore, narrating experiences alone might not be helpful for those who keep on revisiting their distressing experiences. Further coping mechanisms need to be applied to reduce their distress in those circumstances. While 20 minutes of listening was able to achieve a positive effect on distress reduction in the study, we believe that patients and caregivers with a great deal of suffering may need more time or additional coping mechanisms.

Our research had several limitations. This pilot study was primarily limited by its small sample size. It was conducted in order to evaluate feasibility, time, adverse events, and effect size in an attempt to predict an appropriate sample size and improve on the study design prior to a full-scale study. In view of the nature of both interventions, blinding of the research could not be implemented. Although the results provide preliminary evidence of the benefit of 5-minute mindful breathing in distress reduction, generalization of the results to all palliative care patients and family caregivers is not possible. The current study included both patients and caregivers with the hope that 5-minute mindful breathing could be used for distress reduction of both populations.[26,27] However, this heterogeneity of the sample populations posed another limitation. The degree the patients were suffering from ineffective symptom control or psychosocial distress was not being differentiated in the study. Exploring the characteristics of the type of distress responding

Table 4. Changes in Distress Score: Comparison Between 5-Minute Mindful Breathing and Listening.

	Techniques						
	5-Minute Mindful Breathing		Listening				
	Median	Mean Rank	Median	Mean Rank	U	z	*P* Value
Minute 5	−2.5	6.30	−1.0	14.70	8.0	−3.208	.001
During[a]	−6.0	5.60	−1.0	15.40	1.0	−3.773	.0001
5 vs 20[b]	−2.5	8.45	−2.5	12.55	29.5	−1.593	.111

[a]During the 5-minute session.
[b]The 5-minute mindful breathing versus 20-minute listening.

to this intervention might shed light on when it might be more effective or less.

There remain questions as to the minimal number of sessions needed to achieve a sustained positive effect, the approximate intervals that would not dilute the beneficial effect, and the applicability of 5-minute mindful breathing in earlier stages of diseases. For those with longer attention span, the benefit of extending the duration of the exercise to 20 minutes could be explored. The practice of mindful breathing as a self-help strategy may prepare patients and families for the impact of the terminality encounter. Given the short life expectancy of patients, palliative care patients and caregivers need rapid symptomatic relief of their distress. The current results provide preliminary evidence that 5-minute mindful breathing may reduce distress rapidly. Further larger scale research is needed to substantiate this preliminary evidence.

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