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## Mindfulness meditation in older adults with postherpetic neuralgia: a randomized controlled pilot study

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### Abstract

This parallel-group, randomized controlled pilot study examined daily meditation in a diverse sample of older adults with postherpetic neuralgia. Block randomization was used to allocate participants to a treatment group ( $n = 13$ ) or control group ( $n = 14$ ). In addition to usual care, the treatment group practiced daily meditation for six weeks. All participants completed questionnaires at enrollment in the study, two weeks later, and six weeks after that, at the study's end. Participants recorded daily pain and fatigue levels in a diary, and treatment participants also noted meditation practice. Results at the .10 level indicated improvement in neuropathic, affective, and total pain scores for the treatment group, whereas affective pain worsened for the control group. Participants were able to adhere to the daily diary and meditation requirements in this feasibility pilot study.

### Introduction

Postherpetic neuralgia (PHN) is a severe, life-altering condition that afflicts approximately 20% to 30% of individuals who have had herpes zoster, more commonly known as shingles.<sup>1</sup> Of the 1 million new cases of shingles in the United States each year, nearly 50% occur in persons 60 years of age or older. By the age of 85, about 50% of adults have had or will have shingles,<sup>2</sup> with 60% being women.<sup>3</sup> As the U.S. population ages, the incidence of shingles will increase, along with a concomitant increase in PHN. Older adults tend to have more severe cases of shingles and develop PHN more often than do younger adults.<sup>4</sup>

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Although an acute episode of shingles typically lasts 3 to 4 weeks, PHN can last for months or even years.<sup>1</sup> The primary cause of morbidity in PHN is pain, and the condition is reported to be one of the most intractable neuropathic pain disorders.<sup>5</sup> Individuals describe this pain as “stabbing,” “burning,” “aching,” and “itching,” resulting in fatigue, interrupted sleep, depression, and anxiety.<sup>6</sup> The ability to perform activities of daily living can be affected, resulting in a loss of independence and decreased quality of life, especially in an older, more vulnerable population.<sup>7–10</sup>

The usual mode of treatment for PHN is pharmacotherapy,<sup>11,12</sup> with tricyclic antidepressants and anticonvulsants recommended by the International Association for the Study of Pain as first-line therapies.<sup>13</sup> Second-line therapies include tramadol and opioid analgesics, with topical capsaicin noted as a possible third-line therapy.<sup>13</sup> Given alone, these medications have well-documented side effects<sup>14</sup>; given in combination to manage the pain of PHN, the probability of adverse drug interactions increases.<sup>15–17</sup> Drug-related side effects are more commonly seen in older individuals, who may have comorbid illnesses and may already be taking several medications.<sup>18,19</sup> Even with a variety of medications, the pain of PHN might not be well controlled.<sup>20,21</sup>

Management of chronic pain using complementary and alternative medicine (CAM) therapies has been examined for a variety of conditions.<sup>22–25</sup> Some of the most commonly used CAM therapies are relaxation techniques, with meditation comprising three fourths of these.<sup>26</sup> Although little research specifically focused on meditation in PHN has been reported in the literature, studies have examined its use in a variety of other chronic conditions. A reduction in the use of pain medications and an improvement in mental health were seen in women with fibromyalgia who received a mindfulness intervention that included meditation.<sup>27</sup> A significant decrease in depressive symptoms was found compared with a waitlist control group. Home meditation practice has been associated with improvement in several outcome measures in chronic pain conditions<sup>28</sup> and has been found to be useful for older adults with pain.<sup>29</sup> Because meditation is typically just one component of mindfulness-based stress reduction (MBSR) programs, investigators have recommended that individual program components (e.g., meditation) be evaluated separately<sup>27,30–34</sup> and in samples that are homogeneous regarding the pain condition.<sup>22,28</sup>

## Method

This pilot study was undertaken to determine whether daily mindfulness meditation would decrease the pain associated with PHN and increase mental health and quality of life in a diverse sample of community-dwelling adults age 50 and older. Examining only the meditation component of what is typically an eight-week MBSR program, a parallel-group, randomized controlled design was used to (1) compare initial estimates of treatment effects in study participants who received usual care plus meditation (treatment group) with those who received usual care alone (control group); (2) assess the feasibility of recruitment of a diverse sample and adherence to a six-week meditation program; and (3) examine the acceptability and experience of practicing meditation from the perspective of study participants. A crossover option (i.e., delayed treatment) for participants initially randomly assigned to the control group was added after enrollment in the study commenced. Given

this pilot study's primary focus on the acceptability of the intervention and its feasibility for an older population, study sample size was partially determined by resource and enrollment constraints, and this study was not intended to have sufficient statistical power to detect medium or small effect sizes either within or between groups. The achieved sample size of 27 was sufficient to determine feasibility and acceptability proportions within a rough margin of error (at most 18.9% for 95% confidence intervals).

## Recruitment

After study approval by the institution's human research review committee, participants were primarily recruited through an article in the local newspaper. Inclusion criteria were 50 years of age or older, able to read and write English, and self-reported persistent pain after the shingles rash had resolved. Exclusion criteria were consistent use of meditation in the previous year; medical instability from severe heart disease, lung disease, or diabetes mellitus; multiple recent falls; pain caused by an acute injury in the previous month; unable to stand independently; and underlying serious illness, such as unexplained weight loss, fever, or pain from cancer.

The principal investigator (PI) screened all potential participants by telephone, followed by an individual face-to-face meeting of qualified participants in a private room at the university's integrative medicine center. After giving written consent, participants completed four questionnaires and were shown how to complete a daily diary of their pain and fatigue levels. A return appointment was made for two weeks later, at which time participants completed the questionnaires a second time. These two testing times before randomization gave participants time to become familiar with the daily diary and was one way to address assessment reactivity, a factor to consider in studies examining the effectiveness of brief interventions.<sup>35, 36</sup>

Group assignment was made by a statistician so that randomization occurred in a 1:1 ratio in blocks of four. Participants were blinded to group assignment until after completion of the second set of questionnaires, at which time the treatment participants received training on the meditation. The PI was blinded to group assignment until after completion of the enrollment questionnaires. Eight weeks after enrollment in the study (i.e., six weeks after randomization to groups), all study participants returned to the integrative medicine center for a third completion of the questionnaires. Participants in the treatment group were then interviewed by the PI about their experiences with meditation and any challenges encountered, and participation in the study ended for them. Participants in the control group were invited to continue in the study in a delayed treatment group; data from this crossover, delayed treatment group are not included here. All participants were equally compensated for their time through the initial eight-week period, but those continuing as the delayed treatment group did not receive additional compensation. Figure 1 shows the flow of participants through the study, following the CONSORT guidelines.<sup>37,38</sup>

## Treatment

Participants in the treatment group had an individual, one-hour session with one of the investigators, a certified MBSR instructor with more than 15 years' experience. The session

focused on what meditation *is*, what meditation *is not*, pain and the stress response, the benefits of meditation, being in the moment, and the specific practice of meditation for this study. To enhance treatment fidelity,<sup>39</sup> the meditation instructor stayed with an agreed upon script within a one-hour session. She taught only one of the ways to practice mindfulness meditation (i.e., focus on breathing while seated comfortably), using compact discs (CDs) developed for the study. She provided all teaching sessions in a private room at the integrative medicine center, and the PI was present to monitor the sessions for adherence to script and time. All participants received training regarding the CDs by the PI, who also explained how to document the meditation practice in the daily diary. The PI telephoned all participants (treatment and control) weekly and reminded them verbally or through a phone message to mail in their daily diaries each week.

### Specifics of the daily meditation

Prior to enrollment of participants, the PI and meditation instructor had considered the age and possible pain level of the target population. Because the meditation literature reports low compliance for meditation interventions (typically, 20 minutes long), the PI and instructor developed a set of six CDs that allowed a gradual increase in meditation time over a six-week period, as depicted in Table 1. Participants were instructed to use the next CD at the end of a week. If the participant did not have time to do the required meditation on any given day, he or she was to listen to a shorter CD, so that at least some time was spent in meditation each day.

### Measures

**Primary outcome measure—pain**—The Short-Form McGill Pain Questionnaire (SF-MPQ-2) was used to describe pain intensity. This 22-item questionnaire describes different qualities of pain and related symptoms using an 11-point scale (0 = *none* to 10 = *worst possible*).<sup>40</sup> The SF-MPQ-2 was designed to provide composite and subscale measures of the major sensory and affective descriptors (e.g., fearful, tiring-exhausting, sickening, etc.) for both neuropathic and non-neuropathic pain.<sup>40</sup> Cronbach's alpha has been reported as excellent for the composite score (.91–.96)<sup>41</sup> and acceptable to excellent (.73–.92) for the four subscales (continuous, intermittent, neuropathic, and affective descriptors of pain) in studies that included a clinical trial for treatment of diabetic peripheral neuropathy<sup>40</sup> and among U.S. veterans with a variety of chronic pain diagnoses.<sup>41</sup> The total and subscale scores of the SF-MPQ-2 have been found to be responsive to change, and such changes were shown to be meaningful to patients.<sup>40</sup>

### Other measures

**Quality of life**—The RAND 36-Item Health Survey 1.0 is a generic, multidimensional health questionnaire that yields an eight-scale profile of physical functioning, bodily pain, role limitations due to physical health problems, role limitations due to personal or emotional problems, emotional well-being, social functioning, energy/fatigue, and general health perceptions.<sup>42</sup> It has been useful in estimating disease burden in a variety of acute and chronic conditions. In more than 25 published studies, reliability statistics have exceeded the minimum standard of .70 recommended for group comparison measurements.<sup>43</sup> All

questions are scored on a scale from 0 to 100, with 100 representing the highest level of functioning possible. Questions for a subscale are averaged to obtain the score for that subscale (0–100 range). For example, higher scores on the bodily pain measure represent less severe and less debilitating pain.<sup>44</sup>

**Depression**—The Center for Epidemiologic Studies Depression Scale is a 20-item scale that measures the major components of depressive symptomatology in the general population (i.e., nonpsychiatric). It has been found to have high internal consistency, with Cronbach’s alphas ranging from .85 to .90 across studies and adequate test–retest reliability.<sup>45</sup> Responses have a possible range of 0 to 60, with a score of 16 points or more considered “depressed.”

**Anxiety**—The State-Trait Anxiety Inventory (STAI) consists of two 20-item scales (a State scale and a Trait scale). Internal consistency reliability estimates for the State and Trait scale scores range from .90 to .94 and from .89 to .96, respectively, in groups of adults,<sup>46,47</sup> and the STAI Trait scale has excellent test–retest reliability (with an average  $r = .88$ ) at multiple time intervals.<sup>48</sup>

**Daily pain level**—Participants rated pain and fatigue levels in a daily diary and mailed the diaries to the PI at the end of each week. An 11-point scale was used (0 = *No Pain* or *No Fatigue* to 10 = *Worst Pain Imaginable* or *Worst Fatigue Imaginable*, respectively). Participants in the treatment group also provided information related to the practice of meditation (i.e., CD used that day, number of times).

## Data analysis

Descriptive statistics were used to assess outcome measures for all participants three times: at enrollment, just before randomization to treatment and control groups, and at the end of the study. Pearson’s chi-squared tests were used to compare distributions of categorical variables measured at enrollment between the treatment and control groups, and  $t$  tests were used to test for differences in outcomes between the two groups. Analyses of variance were used to examine the significance of main effects and interactions of selected enrollment characteristics and the treatment on different outcomes over time. Pearson’s correlations with cluster-robust standard errors<sup>49</sup> were used to examine bivariate associations between selected outcome measures, adjusting for impacts of the nesting of repeated measures within individuals. Due to the small sample size in this pilot study, adjustments for multiple comparisons were not made, and although statistical tests were judged to be significant at the .05 level, the .10 alpha-level was noted as well. Further, calculated  $p$ -values should be viewed with some caution due to our use of parametric statistical tests with small samples sizes. Although results at the .10 level were not judged to be statistically significant, effect size measures of Cohen’s  $d$  for comparisons of means between groups and  $d_z$  for comparisons of means within groups were noted for comparisons with  $p$ -values less than .10 and compared to the usual cut-offs for “small”, “medium”, and “large” effect sizes of 0.2, 0.5, and 0.8 for  $d$  and 0.14, 0.35, and 0.57 for  $d_z$ .<sup>50</sup> Statistical analyses were conducted in SAS 9.2<sup>51</sup> and Stata 13.1.<sup>52</sup>

## Results

### Sample demographics and pain characteristics at entry to study

The mean (*SD*) age of the participants was 72 (9.6) years, with a range of 55 to 90 years. The participants' other demographic characteristics are presented in Table 2. Participants rated their pain level at entry to the study, with the majority (85%) reporting moderate or severe pain experienced on a daily basis (67%). Participants were evenly divided in the time since a shingles diagnosis, with almost one third reporting less than a year since diagnosis, one third reporting greater than a year but less than three years, and the rest reporting greater than three years. Three quarters were currently taking at least one PHN-related pain medication. Half the participants indicated they had pain in addition to the pain from PHN. The location of pain from PHN was almost evenly divided among three areas: face, head, or neck (29%); chest and abdomen (33%); and back, extremities, or internal (37%; see Table 3).

### Daily meditation practice

Across the 13 participants in the treatment group, the average rate of reporting whether meditation occurred on a given day or not was 98.2%. Of days in which meditation status was reported, the average rate of meditation was 98.9%. Even if one assumes that every day for which meditation status was not reported represents a day of nonmeditation, the average rate of meditation during the six-week treatment period was 97.1%.

### Changes in outcomes over time

Table 4 summarizes the descriptive statistics for outcomes at enrollment, Week 2, and Week 8. Changes in these outcomes over time were examined using *t* tests at both the  $p < .05$  and the  $p < .10$  levels. Specifically, neuropathic pain showed evidence of improvement between enrollment and study completion for the treatment group that approached significance ( $p = .069$ ,  $d_z = 0.55$ ), as did the total pain score ( $p = .057$ ,  $d_z = 0.58$ ). Moreover, there was evidence of a difference in trends that approached significance ( $p = .058$ ,  $d = 0.76$ ) for severity of affective pain between the treatment and control groups, with worsening conditions in the control group between enrollment and study completion, and improved measures for the treatment group in the same period. There were also significant ( $p = .028$ ,  $d_z = 0.45$ ) improvements in health change scores across both groups between time of second testing (Week 2, before randomization) and completion of the study (Week 8), and significant ( $p = .040$ ,  $d_z = 0.42$ ) decreases in physical role limitation scores across both groups between enrollment and Week-2 testing (indicating possible assessment reactivity issues for this measure). A difference in trends also approached significance ( $p = .083$ ,  $d = 0.69$ ) between treatment and control groups from Week-2 testing to completion of the study at Week 8, with increase in physical functioning observed for the treatment group, whereas the control group remained relatively unchanged. Emotional well-being scores showed evidence of improvement ( $p = .078$ ,  $d_z = 0.53$ ) for the treatment group between Week 2 and Week 8, whereas state anxiety decreased significantly ( $p = .043$ ,  $d_z = 0.41$ ) across both groups during the same period; depression scores decreased significantly ( $p = .036$ ,  $d_z = 0.63$ ) for the control group between enrollment and completion of the study at Week 8, but not for the treatment group.

## Relationships between PHN pain and outcome measures across enrollment, Week 2, and Week 8

Table 5 shows that neuropathic, affective, and total pain scores have significant negative relationships with physical functioning, role limitations due to physical health, and emotional well-being, and significant positive correlations between these three measures of pain, depression, and anxiety. Overall, the strongest associations between measures of physical and emotional health and pain were with affective pain.

## Discussion

In addressing the first aim of this pilot study to compare initial estimates of treatment effects, we found that affective pain and physical functioning improved in the treatment group compared with the control group. Physical functioning was particularly important for these community-dwelling older adults. Although these changes were not statistically significant, the trend was in the direction supporting the intervention. We also observed correlations showing especially strong relationships between severity of affective pain and measures of physical and emotional health.

Our question about the feasibility of the treatment for a diverse sample was addressed by the response of potential participants to the study, successful enrollment of those meeting study criteria, and high compliance (97.1%) with the study protocol. We believe we would not have seen this rate if the treatment had not been acceptable to the participants in the treatment group. Additional support was indicated by 12 of the 14 control-group participants (85.7%) choosing to continue in the crossover phase for an additional six weeks to receive the treatment.

It is possible that the six-week length of time for practicing meditation may not have been long enough for participants to experience the full benefits of meditation. Due to the high degree of adherence reported by participants to the six-week protocol in the pilot study, we anticipate that they would be able to adhere to an eight-week protocol, which is the standard length of time seen in MBSR programs.<sup>53</sup> Relatedly, the high degree of adherence reported by participants for daily diary completion and follow up evaluations further supports the continued use of these tools in larger studies.

## Limitations

Participants who reported pain related to other conditions ( $n = 14$ ) might not have differentiated their PHN pain from their other pain, which could have affected their ratings. Medications taken while enrolled in the study, which were not recorded, may have affected daily ratings and responses to questionnaires. It is not known what effect investigator attention or daily diary ratings may have had on the responses to the questionnaires. Receptivity to the meditation practice could have been affected by these daily assessments, and questionnaire responses by both groups may have been affected by the daily diary recordings.<sup>54</sup> Although randomization and holding nontreatment conditions constant for all participants (i.e., three testing times, weekly phone calls) were ways to enhance internal validity in our study, external validity issues were not addressed by our study design. In

other words, generalizability of the findings to individuals who are not contacted weekly or keeping daily diaries is likely not possible.

### Implications and Recommendations

Geriatric clinical nurse specialists and all nurses who work with older adults should take note of the severity of this painful condition, as confirmed by the reported pain levels in this sample of individuals with postherpetic neuralgia. Thorough pain assessment is especially important in nonverbal or cognitively impaired older adults with a history of shingles.

Study results support several suggestions for future research in this area. Acceptance of and adherence to this intervention was high, indicating that a larger study with sufficient sample size would be feasible and could yield clearer, more conclusive results. Effect size measures noted in this study could also be used to inform power analyses for such studies. Increasing the length of time for the treatment from six weeks to at least eight weeks in a future study is also recommended.

The pilot study showed that mindfulness meditation was acceptable to a diverse sample of older adults, with Hispanics comprising 40% of the study enrollment. This is an important consideration for replicating this intervention and focusing on this group because Hispanic older adults comprise one of the most rapidly growing segments of our aging population.<sup>55</sup> As a CAM intervention, meditation offers a relatively inexpensive, nonpharmacologic complementary therapy for managing pain related to PHN. Future studies should specifically include data about type and amount of medication used for pain while enrolled in the study. This would provide additional objective data in evaluating the effects of meditation for pain management. An intervention study, with a larger sample size focusing on an older population living in the community, could contribute to the literature base supporting meditation for pain relief. It could provide specific guidelines for other nurses interested in the use of meditation as a clinical intervention for PHN.

In addition to mindfulness meditation, future studies could include the comparison of a variety of meditative practices (e.g., yogic, mantram, tai chi) alone or in conjunction with the usual teaching and practice of meditation within a structured 8 to 10 week program. This would help determine which practice and delivery mechanisms might be most acceptable to and cost effective for older adults in pain. Studies could also include homebound older adults in pain or those in long term care facilities.

Results of this pilot study will support a follow up randomized clinical trial examining meditation in adults with postherpetic neuralgia and related conditions. Based on participant acceptability and adherence to all components of this feasibility study, modifications will be made to allow for sufficient time for the actual meditative practice (i.e., having a minimum of 15 minutes daily for 8 weeks before post test measurement of variables). Statistically significant findings in future studies will lend support to the incorporation this nonpharmacologic approach into the plan of care for the management of chronic pain in older adults.



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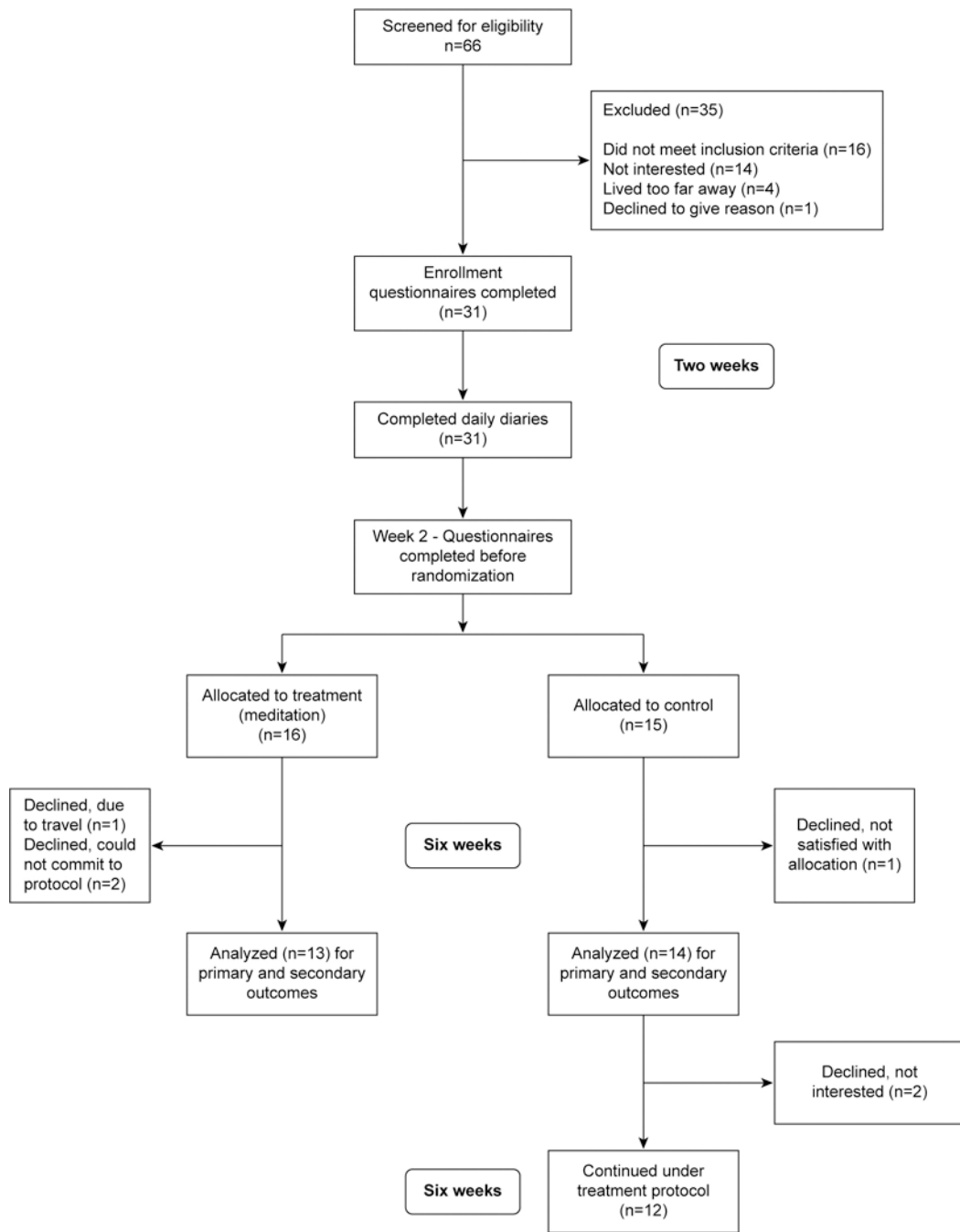
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**Fig. 1.**  
Participant flow through the study.

**Table 1**

Six-week meditation schedule.

CD Number	Time	Frequency
1	3 min, 34 sec	2 times per day
2	5 min, 18 sec	2 times per day
3	7 min, 41 sec	2 times per day
4	10 min, 24 sec	2 times per day
5	13 min, 52 sec	1 time per day
6	15 min, 43 sec	1 time per day

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**Table 2**

Demographic characteristics of study participants.

	Meditation group (n = 13)		Control group (n = 14)		Total (N = 27)	
	N	%	n	%	N	%
Study recruitment						
Newspaper article	10	76.9	13	92.9	23	85.2
Other	3	23.1	1	7.1	4	14.8
Gender						
Male	7	53.8	5	35.7	12	44.4
Female	6	46.2	9	64.3	15	55.6
Ethnicity						
American Indian	1	7.7	1	7.1	2	7.4
Hispanic	8	61.5	3	21.4	11	40.7
White	4	30.8	10	71.4	14	51.9
Education						
High school graduate or less	1	7.7	2	14.3	3	11.1
Some college	6	46.2	7	50.0	13	48.1
Bachelor's degree or higher	6	46.2	5	35.7	11	40.7
Marital status						
Single	1	7.7	1	7.1	2	7.4
Married	9	69.2	7	50.0	16	59.3
Divorced	1	7.7	5	35.7	6	22.2
Widowed	2	15.4	1	7.1	3	11.1
Retired						
Yes	10	76.9	12	85.7	22	81.5
No	3	23.1	2	14.3	5	18.5

**Table 3**

Postherpetic neuralgia pain status at enrollment in the study.

	Meditation (n = 13)		Control (n = 14)		Total (N = 27)	
	n	%	n	%	n	%
Years since shingles diagnosis						
1 year or less	4	30.8	4	28.6	8	29.6
1–2 years	5	38.5	5	35.7	10	37.0
3 years or more	4	30.8	5	35.7	9	33.3
PHN pain medication						
None	3	23.1	3	21.4	6	22.2
At least one	10	76.9	11	78.6	21	77.8
PHN pain level at enrollment						
Mild pain	2	15.4	2	14.3	4	14.8
Moderate pain	5	38.5	5	35.7	10	37.0
Severe or greater pain	6	46.2	7	50.0	13	48.1
Days of PHN pain at enrollment						
0–6 Days/week	5	38.5	4	28.6	9	33.3
7 Days/week	8	61.5	10	71.4	18	66.7
Other non-PHN pain						
No pain	7	53.8	6	42.9	13	48.1
Present	6	46.2	8	57.1	14	51.9
PHN pain location						
Face, head, or neck	3	23.1	5	35.7	8	29.6
Front chest & abdomen	7	53.8	2	14.3	9	33.3
Back, extremities, or other	3	23.1	7	50.0	10	37.0

**Table 4**

Means and standard deviations of measures at enrollment, immediately before randomization (Week 2), and at completion of study (Week 8).

	Enrollment	Week 2	Week 8
	Mean $\pm$ SD	Mean $\pm$ SD	Mean $\pm$ SD
Emotional well-being <sup>a</sup>			
Meditation	72.7 $\pm$ 20.5	66.2 $\pm$ 15.6	75.4 $\pm$ 16.9
Control	72.1 $\pm$ 20.7	71.8 $\pm$ 20.6	74.1 $\pm$ 20.5
Health change <sup>a</sup>			
Meditation	46.2 $\pm$ 17.2	40.4 $\pm$ 28.0	61.5 $\pm$ 24.2
Control	46.4 $\pm$ 23.7	46.4 $\pm$ 23.7	51.8 $\pm$ 20.7
Bodily pain <sup>a</sup>			
Meditation	56.3 $\pm$ 21.0	49.0 $\pm$ 27.7	54.7 $\pm$ 19.1
Control	53.0 $\pm$ 22.6	52.9 $\pm$ 21.4	56.6 $\pm$ 20.2
Physical functioning <sup>a</sup>			
Meditation	61.2 $\pm$ 25.3	57.7 $\pm$ 30.0	68.1 $\pm$ 26.1
Control	66.8 $\pm$ 32.5	67.1 $\pm$ 30.3	66.1 $\pm$ 33.4
Physical-role limitations <sup>a</sup>			
Meditation	68.8 $\pm$ 26.3	60.6 $\pm$ 32.6	54.3 $\pm$ 30.2
Control	76.8 $\pm$ 22.0	67.4 $\pm$ 21.4	66.1 $\pm$ 23.9
Total CES-D score <sup>b</sup>			
Meditation	9.2 $\pm$ 9.8	12.0 $\pm$ 12.4	9.9 $\pm$ 9.1
Control	10.1 $\pm$ 6.2	10.4 $\pm$ 10.8	7.4 $\pm$ 5.7
State anxiety <sup>c</sup>			
Meditation	28.5 $\pm$ 9.5	35.2 $\pm$ 13.0	26.8 $\pm$ 9.4
Control	27.9 $\pm$ 6.8	28.3 $\pm$ 7.4	27.0 $\pm$ 7.3
Affective pain <sup>d</sup>			
Meditation	2.7 $\pm$ 2.4	2.7 $\pm$ 2.7	1.8 $\pm$ 2.0
Control	1.2 $\pm$ 1.6	1.3 $\pm$ 1.2	1.9 $\pm$ 2.0
Total pain score <sup>d</sup>			
Meditation	3.5 $\pm$ 2.2	3.2 $\pm$ 2.3	2.6 $\pm$ 1.6
Control	2.4 $\pm$ 1.5	2.3 $\pm$ 1.2	2.1 $\pm$ 1.5

<sup>a</sup>RAND 36-Item Health Survey 1.0; lower scores indicate worse health.

<sup>b</sup>Center for Epidemiologic Studies-Depression Scale; lower scores indicate less depression.

<sup>c</sup>State-Trait Anxiety Inventory; lower scores indicate less anxiety.

<sup>d</sup>Short-Form McGill Pain Questionnaire; lower scores indicate less pain.



**Table 5**Correlations among selected pain measures and measures of physical and emotional health ( $N = 81$ ).

	Neuropathic pain <sup>a</sup>	Affective pain <sup>a</sup>	Total pain score <sup>a</sup>
	Pearson's correlation	Pearson's correlation	Pearson's correlation
Health change <sup>b</sup>	-0.11	-0.27	-0.22 <sup>†</sup>
Physical role limitation <sup>b</sup>	-0.37*	-0.42**	-0.43*
Physical functioning <sup>b</sup>	-0.39*	-0.63***	-0.51**
Emotional well-being <sup>b</sup>	-0.27**	-0.46***	-0.34**
Depression <sup>c</sup>	0.48**	0.55***	0.54**
State anxiety <sup>d</sup>	0.32 <sup>†</sup>	0.38*	0.34 <sup>†</sup>

<sup>a</sup> Short-Form McGill Pain Questionnaire; higher scores indicate more pain.

<sup>b</sup> RAND 36-item Health Survey 1.0; higher scores indicate better health.

<sup>c</sup> Center for Epidemiologic Studies-Depression Scale; higher scores indicate more depression.

<sup>d</sup> State-Trait Anxiety Inventory; higher scores indicate more anxiety.

<sup>†</sup>  $p < .10$ .

\*  $p < .05$ .

\*\*  $p < .01$ .

\*\*\*  $p < .001$ .