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EFFECT OF MINDFULNESS INTERVENTION ON THE INTENSITY OF PAIN IN NASOPHARYNGEAL CANCER PATIENTS UNDERGOING RADIATION TREATMENT

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Abstract

Background: Physical responses that occur in patients with nasopharyngeal cancer are the emergence of pain due to the effects of treatment. The problem of pain in these patients at the stage of treatment remains critical to solve because it can cause comorbidity, psychological trauma and mortality. Mindfulness intervention is considered useful in transforming consciousness into the stage of acceptance.

Objective: This study aims to determine the effect of mindfulness intervention on the intensity of pain in nasopharyngeal cancer patients undergoing radiation treatment.

Methods: This was a quasi-experimental study with pretest posttest control group design. Thirty patients were selected using consecutive sampling, which divided into experiment and control group. Visual Analogue Scale (VAS) was used to measure pain. Each respondent received mindfulness intervention for six sessions, divided into three meetings. Paired t-test was used for data analysis.

Results: The results showed a significant reduction of pain from 4.12 (moderate pain) to 3.06 (mild pain) in the experiment group. There was a significant difference in pain level before and after mindfulness intervention ($p=0.001$).

Conclusion: Mindfulness is effective in reducing pain intensity level in nasopharyngeal cancer patients undergoing radiation therapy.

Keywords: pain; anxiety; mindfulness; nasopharyngeal cancer

INTRODUCTION

Prognosis, symptoms of disease, and effect of treatment on cancer patients will give different physical and psychological responses to each individual. Physical response that often occurs in cancer patients is the onset of pain ([Carr et al., 2002](#)). In patients with advanced stage of nasopharyngeal cancer with radiation therapy, pain primarily occurs during treatment and

may last for several months even years after treatment is completed ([Lu, Cooper, & Lee, 2010](#); [Wallace, 2008](#)). Thirty percent of nasopharyngeal cancer patients will complain of pain during their diagnosis and will increase to 65 -85% in its development and treatment ([Haisfield-Wolfe, 2009](#)). The effect of radiation therapy on nasopharyngeal cancer patients is a major cause of pain that often

causes different psychological distress from patients with other types of cancer. It is stated functional impairment due to radiotherapy such as respiratory disorders, inability to communicate, swallowing disorders, and physical appearance will cause emotional trauma. This physical impact can last up to 3 months after completion of treatment ([Haisfield-Wolfe, 2009](#); [Lu et al., 2010](#)).

Psychological management in nasopharyngeal cancer patients during treatment is very important, because psychological distress can lead to comorbidity and trauma. Comorbidities in patients with nasopharyngeal cancer may decrease survival rates and increase mortality risk. Studies show that 40% of nasopharyngeal cancer patients die after 23 months due to comorbidity ([Toth, 2009](#)). The results of the study showed that unpleasant emotional coping would appear in patients with nasopharyngeal cancer at the beginning of the diagnosis and would increase especially during treatment, then decrease in 3 months post-treatment with emotional coping include self-blame, wishful thinking and avoidance ([Elani & Allison, 2011](#)).

To avoid maladaptive coping at this stage of treatment, a nurse should introduce an effective coping strategy in patients with nasopharyngeal cancer, so that the patient can adapt and accept his/her current condition. Health education and accommodative coping strategies can reduce pain and improve the quality of life of nasopharyngeal cancer patients ([Haisfield-Wolfe, 2009](#)).

Pain management must be integrated both physically, psychologically, socially and spiritually. Forty-three cancer patients with pain and anxiety cannot be managed only pharmacologically with analgesics and antidepressants ([Mystakidou et al., 2012](#)). Research on pain in cancer patients suggests that combining interventions between analgesics and psychological multi-component therapy can make patients more stable in controlling anxiety and depression associated with pain compared with patients who have only medication alone ([Porcelli,](#)

[Tulipani, Di Micco, Spedicato, & Maiello, 2011](#)). In systematic review it has been identified that psychotherapy therapy such as Mindfulness Based Intervention gives benefit to mamae cancer patient to decrease pain, fear of recurrence and improve physical health and quality of life ([Johnson, 2011](#)).

Mindfulness method can accommodate aspect of individual spirituality toward acceptance stage. The study of lung cancer patients' survivors showed that spirituality had an effect on lymphocyte-mediated biomarkers that could increase disease response rates for treatment, a 3-year survival increase, and an average increase in post-chemotherapy lymphocyte count ([Kharitonov, 2012](#)).

In contrast to other psychotherapy, the practice of mindfulness meditation is done with full awareness, which aims to realize who we are. Being aware of yourself is related to the ability / spirit to recognize and accept yourself and the conditions that are happening today. Meditation is the stage of acceptance and not judgment ([Kharitonov, 2012](#)). When mindful conditions are achieved, attention will not be focused on the past or the future, the individual will not judge or deny what is happening today and prove to be very effective in reducing psychopathology. Practicing mindfulness can be done in various conditions and daily situations such as when working, with partners, and when we own. Mindfulness aims to transform consciousness and integrate mind, body, and soul ([Prabowo, 2012](#)). It is this self-consciousness that helps the individual toward the acceptance stage as an effective coping strategy of adaptive conditioning ([Antoni, 2013](#)). The purpose of this study was to look at the effect of mindfulness on the intensity of pain in nasopharyngeal cancer patients during radiation therapy.

METHODS

Research design

This was a quasi-experimental study with pretest posttest control group design.

Target population and sample

The population of the study was all patients with advanced stage nasopharyngeal cancer in radiotherapy ward of the General Hospital of Kariadi Medical Center Semarang. Thirty patients were selected using consecutive sampling, which divided into experiment and control group with inclusion criteria: adult patients aged 20-70 years, received radiation treatment, experienced pain, could do verbal communication, no hearing loss and no mental disorders.

Instrument

Visual Analogue Scale (VAS) was used to measure pain. VAS was first introduced by Hayes and Patterson in 1921 to assess subjectively the pain of the individual (Klimek et al., 2017). VAS is a horizontal line from scale 0-10 where respondents are asked to assess the pain based on numerical scoring scale from number 0 which means no pain until the number 10 which means the peak of the pain. The validity a VAS in pain in adults was 0.29 to 0.56 and the reliability was $r = 0.80$, which means that the tool was valid and reliable to measure pain in cancer patients (Jensen, 2003). The measurement of pain intensity in the respondents was done before and after intervention.

Intervention

Mindfulness interventions were administered for 6 sessions in the experiment group, while the control group only got standard service in the hospital, which was radiation and pharmacological therapy. Mindfulness exercises were performed by a certified therapist in this intervention, assisted by 2 certified research assistants. Mindfulness exercise was done in 3 meetings for 3 days. The first day meeting was introductory sessions and explorations of experiences with targeted respondents to express their experiences about disease complaints and perceived pain responses. The second- and third-day meetings were mindfulness sensory

and emotional exercises with body scanning and self-conscious mindfulness exercises, with the target respondent realizing the sensory, emotional and current feelings and being able to receive them well. On the first day of the meeting, respondents were given a mindfulness exercise leaflet to be practiced at home.

Statistical analysis

Data were in normal distribution. Paired t-test was used to know the differences in pain intensity before and after the implementation of mindfulness.

RESULTS

Of the 34 respondents who met the inclusion criteria and stated that they were willing to participate in the training, one respondent in the experiment group did not follow the full training session, so they were excluded from the sample.

Based on the demographic data it was found that the gender of most respondents was male, 12 males in the experiment group (75%) and 11 males in the control group (64.7%). Majority of respondents were in advanced stage of nasopharyngeal cancer. The average age of respondents in the experiment group was 46.4 years and the control group was 48.9 years. The average number of radiations received by respondents was 16 times. The characteristics of respondents were shown in the following tables 1 and 2.

Table 3 shows that before intervention the mean intensity of respondents was at the moderate pain level, which VAS value of pain intensity in the experiment group was 4.12 in the experiment group, and 4.24 in the control group. After given Mindfulness intervention, there was a reduction of pain level in the experiment group to 3.06, while pain level in the control group was increased to 4.35.

Table 1 Characteristics of the respondents based on gender, stadium of cancer and social support

Characteristic	Experiment group (N = 16)	Control group (N=17)	Total (N=33)
Gender			
Male	12(75%)	11 (64.7%)	23 (69.7%)
Female	4 (25%)	6 (35.3%)	10 (30.3%)
Stadium of Cancer			
Stadium 3	14 (87.5%)	15 (88.2%)	29 (87.9%)
Stadium 4	2 (12.5%)	2 (11.8%)	4 (12.1%)
Social Support			
Yes	15 (93.8%)	16 (94.1%)	31 (93.9%)
No	1 (6.2%)	1 (5.9%)	2 (0.1%)

Table 2 Characteristics of respondents based on age and the number of radiations received

Variable	Mean	SD	Min-Max	95% CI
Age				
Experiment group	46.4	12.6	24-67	40.22-52.66
Control group	48.9	11.4	24-62	43.06-54.82
Number of radiations received				
Experiment group	17	8.7	2-31	12.67-21.96
Control group	15	6.9	1-26	11.08-18.21

Table 3 Pain intensity before and after given Mindfulness intervention

Pain intensity	Mean	SD	Min-Max	95% CI	P-value
Before intervention					
Experiment group	4.12	0.957	2-6	3.61-4.64	0.088
Control group	4.24	1.348	2-6	3.54-4.93	0.101
After intervention					
Experiment group	3.06	0.854	2-5	2.61-3.52	0.019
Control group	4.35	1.455	2-7	3.60-5.16	0.225

Table 4 Relationship of age, gender, number of radiations received, social support, and pain intensity

Variable	Sig. Value
Age	0.596
Gender	0.354
Number of radiations received	0.11
Social support	0.507

Table 4 shows that there were no significant relationships between age, gender, number of radiations received, social support with pain intensity with p-value >0.05. While The results of paired t-test as shown in the table 5

indicated that there was a significant effect of mindfulness intervention on pain intensity with p-value 0.001 (<0.05), while there was no effect of intervention in the control group on pain intensity.

Table 5 Effect of Mindfulness intervention on pain intensity in patients with Nasopharyngeal Cancer using Paired t-test

Variable	Mean	SD	95% CI	Sig. value
Pain intensity				
Experiment group	1.062	3.93	0.607-1.518	0.001
Control group	-0.118	0.60	-0.426-0.191	0.431

DISCUSSION

The intensity of pain experienced by respondents prior to intervention in the experiment group and control group was on the level of moderate pain. Pain associated with cancer according to some studies on a moderate to severe scale, particularly occurring during the treatment period, which is due to the effects of treatment and the stage of cancer itself ([Carr et al., 2002](#); [Mystakidou et al., 2012](#); [Tang, Luo, Rong, Shi, & Peng, 2012](#)). Thirty percent of nasopharyngeal cancer patients will complain of pain when they are diagnosed and will increase to 65-85% in development and treatment ([Elani & Allison, 2011](#)).

Based on respondents' statements, it was found that the intensity of perceived pain raised and increased during radiation. The perceived pain response due to functional impairment due to radiopaque effects breathing difficulties, swallowing disorders and mucositis in the mouth. In accordance with previous research that the pain in patients with nasopharyngeal cancer during radiation treatment is mainly due to the side effects of the treatment, which will be felt by patients both acutely and chronically. These side effects are influenced by several things one of which is the location and the radiation dose that has been given ([Haisfield-Wolfe, 2009](#)). Pain due to radiation mainly occurs due to cell damage to salivary glands. At low doses (<30 Gy) or 15 times the damage radiation has not occurred widely. Damage to the salivary glands that cause difficulty swallowing and mucositis will occur on day 21 - 35 radiation.

The results showed that the average amount of radiation received by the respondents in the

experiment group was more than the control group but the pain response was greater in the experiment group compared with the control group, which was indicated by the mean value of VAS. These results indicated that the pain response was influenced by the subjective perception of individual pain.

From the results of the study showed that there was no correlation between the characteristics of respondents with the intensity of pain perceived. Most respondents were young adult age with male gender. Some pain management experts claimed that the pain response in male adult patients will fully respond to pain compared with elderly patients ([Stuart, 2014](#)). The results indicated that the intensity of the respondent's pain was still moderate pain; it also shows that the pain response was mainly influenced by the perception of pain of each individual.

In this study, social support is defined as the absence of a family that accompanies patients during the treatment process (patients away from the family). Previous research has shown that the social support of families in radiation patients positively correlated with overall short-term adjustment ($r = -0.18$, $P < 0.05$). The overall short term adjustment referred to here was the presence of physical and psychological disorders that cause and affect anxiety, depression and perception of pain ([Ma, 1998](#)). In this study, most respondents got social support from their families, possibly because of this social support cause a sense of happiness that affects neuroendocrine response with increased endorphin that may decrease the response to pain.

Provision of mindfulness is one factor that greatly affects the decrease in the average

level of pain in the experiment group compared to the control group. In the experiment group, the respondent's pain was obtained by integrative management, medically (with analgesic NSAID) and psychological (with psychotherapy of mindfulness), while the control group only received medical therapy. Porcelli et al suggests that pain management in cancer patients that combine analgesics and psychological multipart therapy may make patients more stable in controlling anxiety and pain-related depression than patients who have only medication alone ([Porcelli et al., 2011](#)). Xinghua Liu et al states that after mindfulness on the respondent with pain stimulus cold pressure treatment increased the tolerance of pain ($p < 0.01$) and decreased the level of pain ($p < 0.05$) ([Liu, Wang, Chang, Chen, & Si, 2013](#)).

In this study, a mindfulness procedure that involves the exploration of experience, body perception and self-conscious mindfulness which is a combination of self-inventory and self-reflection coping strategies aimed at decreasing emotional reactions and enhancing cognitive judgment positively (changing perceptions) so as to foster acceptance. Awareness to accept is what is able to reduce the intensity of pain and foster confidence and motivation to perform treatment.

Limitations of the study

The measurement of the intensity of pain in respondents was not done by researchers in every meeting, so researchers could not assess the difference of pain at the first day of meeting until the third day.

CONCLUSION

It is concluded that the provision of mindfulness interventions has a significant effect in reducing the intensity of pain in patients with nasopharyngeal cancer undergoing radiation therapy. Mindfulness intervention can be performed as a nursing intervention for self-management of patients in palliative care. It is necessary to develop

further research with larger number of samples and varied variables, so that it can enrich science in the field of nursing.

Declaration of Conflicting Interest

None declared.

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Author Contribution

All authors contributed equally in this study.

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