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Review Article

Does Mindfulness Training Have an Effect on Brain Tumor Patients? A Literature Review

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Abstract

Aims: The purpose of this research was to examine into the recent spike in curiosity regarding mindfulness-based therapy and their benefits on patients with brain tumors.

Methods: The approach to searching was implemented by using certain keywords in an online database. This review's inclusion criteria were: (1) study of experimental design, (2) only brain tumor patients, and (3) Mindfulness-based therapy. The search was limited to English and Indonesian literature published between 2017 and 2023. To assess the quality of the included studies, the Critical Appraisal Skills Program (CASP) tool, which is available for intervention research, was employed.

Results: For this investigation, the original search method returned 581 documents. After a comprehensive study of these papers and application of the inclusion and exclusion criteria, four papers met the inclusion criteria. The programs lasted between 8 and 12 weeks. While mindfulness-based therapies revealed a good benefit for brain tumor patients, one study found a negative effect on family well-being.

Conclusions: According to the journals reviewed, this study intends to evaluate the benefits of mindfulness training for improving the condition of brain tumor patients. The biological factors of the tumor or the participant's cognitive profile may influence improvement.

Keywords:

Brain tumor, Mindfulness-Based Intervention, Patient, Quality of Life, Systematic Review

INTRODUCTION

Patients with head tumors are increasing every year(1). In Indonesia, 7 out of 100,000 people have the disease, and the mortality rate from the tumors reaches 4.25 out of the 100,000 population each year(2). Surgery is one of the main interventions for patients with head tumors (3,4), but brain tumor surgery cannot completely eliminate the symptoms experienced by patients (5). Even though brain tumor patients have undergone surgery, they still experience residual symptoms, such as headaches,

impaired mobility, impaired daily activities, and impaired vision (6).

The lesions can range in severity from asymptomatic to causing functional impairment and a poor quality of life, despite the fact that they are frequently benign tumors (7,8). Seizures, visual abnormalities, cognitive decline, emotional disorders, and neuropathy are among symptoms that patients with brain tumors may encounter (9,10). Patients with brain tumors often experience this (11,12). There is presently a lot of data demonstrating the benefits of mindfulness-based therapy in

improving patients' quality of life when suffering from life-threatening illnesses, such as cancer(13). Patients with breast cancer can experience improvements in their physical, psychological, and spiritual well-being with mindfulness-based therapy (14). There is lots of study on mindfulness, but there is currently little information on how meditation benefits people with brain tumors (15,16).

METHODS

Search Strategy

In order to assess patients' subjective reactions following the application of mindfulness therapy for brain tumors, this study reviews the body of prior research. The goal of the search method is to locate published articles. A strategy of internet search was used to get the data for this literature study. We used Science Direct, PubMed, and Google Scholar to conduct searches. The terms "mindfulness" and "brain tumor" are combined. Journals that examined mindfulness therapy's impact on patients with brain tumors were the main target of the search. The inclusion criteria for the articles included in this review were: published between 2017 and 2023; in English and Indonesian; involving human subjects; clinical trials; and a search for studies involving adult patients with brain tumors.

Screening Article

To determine whether articles have the potential to match the specified criteria, an initial title screening and an abstract screening are conducted. Following that, every article that was considered relevant during the first screening was reviewed. By looking through the study's references, other publications that were missed in the initial literature search were discovered. Every abstract was examined by two reviewers in light of the inclusion requirements. In order to prevent article duplication, the initial reviewer looks over all abstracts and titles. A second reviewer used the same selection criteria to evaluate titles and a sample of abstracts in a separate

assessment. The two reviewers then concurred on which articles fulfilled the requirements for inclusion. The decision to incorporate a study was taken subsequent to a thorough reading of the book. Discussions with a third reviewer helped settle disagreements between the first and second writers, who were responsible for evaluating which papers fit the inclusion requirements.

Data Extraction

Each article's data is processed by generating a summary that includes the following information: author, year, research type, country of origin, sample (including sample size and inclusion criteria), intervention, results, and research limitations.

Study Quality Study

Every article undergoes a quality review utilizing the Critical Appraisals Skill Program (CASP) standard format, which is written in Indonesian. Three factors are taken into consideration when determining if a study is high-quality and has little chance of bias: the validity of the research findings, the nature of the findings, and the potential benefits to the community. Eleven checklist items total with yes/no response alternatives were used to conduct the assessment.

RESULTS

From the results of searches conducted via Science Direct, Google Scholar, and PubMed. Journal totals are obtained using old keyword combinations. Then 581 journals were obtained using a combination of the keywords "mindfulness" and "brain tumor", with 296 duplicate abstracts removed. Total abstracts excluded due to 2017-2023 deadline (n=56). title not relevant (n=113). Review papers (n=28), could not access full text (67). Most of the excluded studies were removed because the population did not meet a specific age range: adults (6), specific target population: brain tumors (10), and the results did not describe the effects of mindfulness in brain tumor patients (n=1).

Table 1. Summary of Included Studies

Author / year	Sample	Design	Results	CASP Score
2017 Christina nombela	Average age 52.89 who underwent surgery at their institution	Randomized Control with one group sample	Anxiety levels were inversely connected with increased verbal nomination scores (Boston test) ($R = -0.84$, $p = 0.04$), according to the Pearson correlation coefficient ($p < 0.005$). The Boston score, on the other hand, showed a positive correlation ($p = 0.91$, $p = 0.004$) with mindfulness-mind-awareness. Furthermore, there was a positive correlation found between Bmindfulness descriptions and phonetic fluency scores ($R = 0.82$, $p = 0.04$). The participants reported subjective improvements in depression and quality of life, despite the fact that the study did not show these effects to be statistically significant.	9
2019/ Richard, N. M	25 adult patients, mean age 47.7 after radiation or surgery	Randomized Control with one group sample	In terms of completed sessions, GMT (98.9%) and BHP (84.4%) had strong compliance rates. GMT enhanced executive function, but neither BHP nor WAIT did (repeated-measures analysis of variance, time-by-group interaction, follow-up $P=0.046$, post-training $P=0.077$). Following training, both intervention groups reported reduced cognitive issues ($P=0.049$) and at follow-up ($P<0.001$). Functional objective achievement was highest in GMT (follow-up $P=0.064$, post-training $P=0.027$).	10
2020 / Claudio De Tommasi	20 Adults Average age 53.8 years after surgery at the neurosurgical	Randomized Control with one group	Nearly all participants showed a positive direction of change before and after,	11

	unit of Christchurch Hospital, New Zealand.	sample	with statistically significant increases on a number of disease-related awareness and quality of life scales; however, the social/family quality of life category showed a decline. Individual differences seem to have a greater correlation with significant diversity in AMT (App-Based Attention Training) use than with tumor histology, progression, or treatment. Those that finished the study gave the treatment positive feedback.	
2020 / Kathrin	18 adult patients aged 31-75 years and 17 control patients with 35 partners aged 30-73 years	Randomized Control with one group sample	In the CBM group, couples attended 3.33 sessions on average (SD 1.09). That matters to patients. In terms of cognitive symptoms (days $\frac{1}{4}$ 1.05) and general diseases (days $\frac{1}{4}$ 0.93), as well as relationship well-being (d $\frac{1}{4}$ 0.68) and compassion (d $\frac{1}{4}$ 0.96), there were group differences in favor of the CBM group. Regarding partners, no discernible group differences were found.	10

DISCUSSION

Mindfulness programs may be beneficial in improving the well-being of those living with chronic illness. adherence with the program is a key indicator in improving outcomes. of all the studies we studied, all stated that patients who followed the training to the end felt the positive impact of this exercise.

As is well known, the histology, location, and course of treatment of brain tumors can all affect the symptoms that they cause. Some patients had to withdraw from the study due to deteriorating health circumstances, which prevented them from

finishing it. According to De Tommasi et al. (2020), there was a 70% decrease in participants with malignant tumors and a 30% decrease with benign tumors. The most frequent explanation given by patients for stopping the trial was fatigue. According to Milbury et al. (2020), patient deaths were the primary reason for this decrease.

Most studies find that patients with brain tumors have cognitive deficits, with executive function (e.g., cognitive flexibility, inhibitory control, planning, working memory), attention, and memory being most frequently affected and lowering quality of life. Although the nature and prevalence of cognitive symptoms may vary

depending on the type of tumor, tumor location, and treatment history (17).

According to neuroimaging, mindfulness training is linked to specific neuromodulation processes that involve activating salience and attention networks, such as the dorsal anterior cingulate cortex and bilateral anterior isolation, and deactivating the default network, which is made up of midline prefrontal areas linked to depressive thoughts and rumination(18). These domains facilitate cognitive functioning concerning memory, focus, and executive functioning (19).

Every study that we considered in our analysis demonstrated the beneficial effects of mindfulness training on cognitive performance. According to Nombela et al. (2017), verbal memory considerably enhanced following training. In patients with primary brain tumors, GMT enhanced executive and everyday function, according to Richard et al.'s 2019 study. After training, processing speed in GMT and BHP rose, with maintenance occurring only in GMT during follow-up. This unanticipated gain might be related to GMT's attentional control training. The fact that GMT participants made significant strides toward their self-identified functional goals further suggests that the benefits of rehabilitation are transferable to real-world situations. Following training, GMT and BHP participants reported reduced cognitive issues, which persisted at the 4-month follow-up. This demonstrates the possibility of lowering cognitive symptoms by using supportive education, healthy lifestyle counseling, and targeted strategy training (GMT) (BHP).

This is consistent with a study by Milbury et al. (2020), which found marginally significant gains in the cognitive domain. In contrast, De Tommasi et al. (2020) found that while social and family well-being decreased, there was a substantial gain in the subscales measuring physical, emotional, and functional well-being. This can be an indication of strain in their

familial ties or a decline in social network interaction and support. This may be linked to a more constrained life for individuals whose health deteriorates or to being confined to home throughout the recovery time (for those with a positive prognosis) and being unable to drive and work in the majority of the sample.

LIMITATIONS

This study only examines literature in English and Indonesian, causing limited study sources, thereby allowing bias in publication.

CONCLUSION

The goal of this study is to evaluate the advantages of mindfulness training for enhancing the quality of life for patients with brain tumors, according to the publications that were reviewed. Complementary therapies like mindfulness training are simple, safe, and require adherence to be used. The biological characteristics of the tumor (including its location and intensity) or the participant's neuropsychological profile (particularly with relation to attention, executive function, or language skills) may determine the benefits. Nurses as healthcare providers can focus on modality therapy, one of which is mindfulness therapy to improve the quality of life of brain tumor patients.

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