Meta-Analysis: Intervention Using Midfulness Training to Reduce Burnout in Medical Doctors

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ABSTRACT

Background: Burnout is one of the mental health problems caused by a high workload that causes excessive stress characterized by symptoms such as anxiety and even depression, because of the seriousness of this burnout problem, the WHO classifies burnout as a disease. Burnout is a very serious problem in many countries, so efforts are needed to prevent and/or reduce the negative consequences and impacts of burnout syndrome. One of the interventions that can be done to achieve this is using the mindfulness method. This study aims to examine the effectiveness of mindfulness in reducing burnout levels in doctors.

Subjects and Method: This meta-analysis study was conducted using PICO as follows: The population is doctors (general and specialist) who work in hospitals. Intervention is mindfulness. Comparison in the form of mindfulness therapy. The outcome is a low level of burnout. Sources of meta-analysis studies were accessed using: Clinical Key, Google Scholar, MEDLINE/PubMed, Science Direct. The articles used in this study are full-text articles with a Randomized Controlled Trial (RCT) study design. This meta-analysis used 10 articles with a total sample of 539 doctors who were divided into two groups (mindfulness group and no mindfulness group). Analysis of the data using the application Review Manager 5.4.1. The purpose of this study was to determine the Standardized Mean difference (SMD) and heterogeneity in the study sample.

Results: The results showed that this study was homogeneous (I^2=47%; P<0.001) so the Fixed Effect Model (FEM) was used. Mindfulness intervention was effective in reducing burnout levels in doctors 0.20 units lower than without using mindfulness and the results were statistically significant (SMD -0.20; 95% CI -0.37 to -0.03; p=0.020).

Conclusion: Mindfulness is effective in reducing burnout levels in doctors 0.20 units lower than without using mindfulness and the results are statistically significant.

Keywords: mindfulness, burnout, doctor.

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BACKGROUND

Burnout is a syndrome caused by work-related stress and can be characterized by emotional feelings (feeling overwhelmed by work demands); depersonalization (feelings of cynicism and disinterest in work), and decreased self-achievement (decreased level of competence and work achievement) (Busireddy et al., 2017). Burnout is one of the mental health problems caused by a high workload that causes excessive stress characterized by symptoms such as anxiety

and even depression, because of the seriousness of this burnout problem, the WHO classifies burnout as a disease (Clough et al., 2017).

Burnout on doctors caused by work has several negative impacts, namely poor quality of personal and social relationships, decreased self-esteem, and poor treatment outcomes for patients. Numerous studies have shown that burnout is common among doctors and medical students around the world. In February 2003, the European Forum of Medical Associations and the World Health Organization issued a statement regarding burnout syndrome among physicians, i.e. burnout is a serious concern because of its increasing cases and calls on all national medical associations to pay attention to the problem (Kalani et al., 2018).

A number of factors are believed to contribute to burnout in doctors and the high risk posed, including workplace culture, working time (length of working hours), high workload, challenges and balance between work and life at home, physical and verbal abuse from patients and family, and unwillingness to seek help to overcome these problems and fatigue. The exact cause of work-related burnout cannot be specified and tends to be a combination of various organizational, social, and personal issues (Ireland et al. 2017).

Until now, burnout has been widely studied. Data shows 40-60% of doctors who practice in hospitals show symptoms of burnout. A survey of physicians in the United States showed an 8.9% increase in burnout among physicians from 2011 to 2014. At the same time, there was a relationship between burnout among physicians, namely the occurrence of performance deficits and the increasing development of mental and physical illnesses. Medical personnel resources, especially doctors, can

decrease in quantity and quality due to burnout syndrome, causing reduced professionalism, increased errors in medical diagnoses, worse patient care, and a declining hospital economy. In general, the average risk of depressive symptoms among physicians increased by 170% when burnout occurred as a result of work (Lebares et al., 2017).

Burnout is a very serious problem in many countries, so efforts are needed to prevent and/or reduce the negative consequences and impacts of burnout syndrome. One of the interventions that can be done to achieve this is using the mindfulness method.

Mindfulness is defined as a human's ability to take full control of himself and know for sure about an action and decision taken, to respond positively when faced with events such as stress, thought burden and work that is felt to be high, through a systematic and routine practice and interpersonal (Martos., 2019). Several types of therapy using mindfulness that have been applied and conducted research include: Mindfulness Based Stress Reduction (MBSR) and Mindfulness Based Cognitive Therapy (MBCT). MBSR is a structured mindfulness meditation program used to reduce suffering caused by physical, psychosomatic, and psychiatric disorders. MBCT is an adaptation of the MBSR program. MBCT is a constructive therapy that detects and discrepancies in the way of thinking used to prevent depression. Mindfulness by using several different methods is done on average through meditation (training) for 8 weeks, which involves eight face-to-face sessions for 2.5 hours plus a full day of repetition. Each session presents various forms of meditation, such as yoga, breathing exercises, words of motivation and self-strengthening of resistance to stressors (Martos, 2019).

Mindfulness is often thought of as part of "third generation therapy" which is based on the need to change thinking patterns with our inner experiences rather than trying to eliminate those (which are considered bad) experiences. The most important milestone for the development of mindfulness therapy was the founding of the Center for Mindfulness at the University of Massachusetts in 1979, by Jon-Kabat-Zinn (Gracia and Blazquez, 2017).

Mindfulness methods are designed and can be applied flexibly, portable, can be used independently and non-invasively. Mindfulness is designed in such a way that a practitioner might find it appealing to a busy schedule. Mindfulness has a big role in reducing the negative influence on doctors and has been proven from various studies. Mindfulness has also shown positive effects in reducing stress in some populations and professions (Chiesa and Serretti 2009). Thus, mindfulness may be an effective intervention to reduce burnout among physicians (Ireland et al., 2017).

Several studies have identified the benefits of Mindfulness in the medical profession. One of them is research that shows a decrease in serum cortisol as a result of intervention using the mindfulness method, the results of the study show that it can reduce stress and burnout, and reduce the risk of disease arising from stress and burnout. Similarly, there is ample evidence of the use of mindfulness training outside the medical profession, especially in cases of depression. Mindfulness has now been recommended by the National Institute for Health and Clinical Excellence to be applied to those who experience recurrent depression, and has shown its effectiveness from several studies that have been conducted (daya and hearn, 2017).

The author is interested in using meta-analysis techniques in this study to make it easier to obtain evidence-based research results with a large number of samples from several primary research data to determine mindfulness interventions in reducing burnout in doctors.

SUBJECTS AND METHOD

A. Study Design

This was a systematic study and meta-analysis. This study uses data obtained from study that has been done previously. Systematic study is a method for synthesizing data using primary research by exploiting reported data through an explicit-systematic search process, integrating data for inclusion in a review (Siddaway et al., 2019).

Meta-analysis is an epidemiological study that combines and statistically combines data from several primary research results that discuss the same hypothesis so that quantitative summary results are obtained (Egger and Smith in Murti, 2018).

B. Inclusion Criteria

1) The article used is a full paper article with the Randomized Controlled Trial (RCT) research method
2) The intervention given is Mindfulness
3) The intervention in the control group was without mindfulness intervention
4) Research subjects are in the age range of 30 - 55 years
5) Research subjects are doctors who are still actively practicing in hospitals
6) The resulting outcome is decreased burnout
7) Articles published in English.
8) Include research results in the form of number of respondents, mean value and standard deviation (SD) value

C. Exclusion Criteria

1) The article is not full text
2) Articles that use a quasi-experimental study design, protocol study, plot study, cohort, case control and cross-sectional.

3) The article uses a language other than English.
4) Articles published before 2000.
5) Research subjects are other health workers or medical students.

D. Operational Definition of Variable

Mindfulness is a condition where a person is really present in a certain situation. It is applied using the method through a systematic and routine exercise as well as interpersonal.

Burnout is the occurrence of a doctor's welfare/health deviation with excessive stress caused by work.

E. Instruments

Published articles on mindfulness interventions to reduce burnout levels in doctors can be accessed in full text, obtained from various databases of appropriate electronic journals including: Clinical Key, Google Scholar, MEDLINE/PubMed, Science Direct. This research was conducted by searching and selecting research results from various races, ethnicities and locations in the world.

F. Data Analysis

This systematic study and meta-analysis was carried out using secondary data obtained from data from previous studies and data processing was carried out using the Review Manager (RevMan 5.4.1).

RESULTS

The selection of articles included in the study was carried out using the Mendeley desktop application. The initial search process yielded 516 articles, after the process of deleting published articles, 489 articles were found with 18 of them meeting the requirements for further full text reviews.
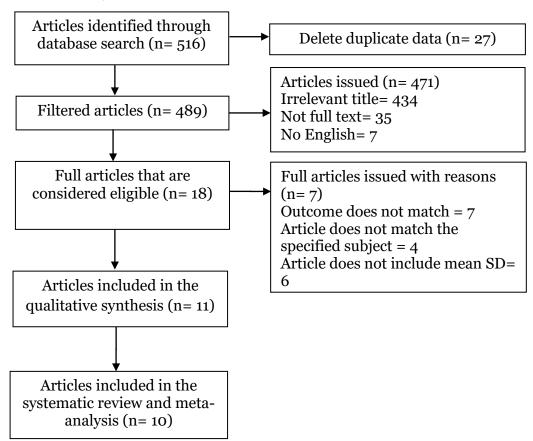
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┌─────────────────────────────┐        ┌──────────────────────────────┐
│ Articles identified through │───────▶│ Delete duplicate data (n= 27)│
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┌─────────────────────────────┐        ┌──────────────────────────────┐
│ Filtered articles (n= 489)  │───────▶│ Articles issued (n= 471)     │
└─────────────────────────────┘        │ Irrelevant title= 434        │
             │                         │ Not full text= 35            │
             │                         │ No English= 7                │
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┌─────────────────────────────┐        ┌──────────────────────────────┐
│ Full articles that are      │───────▶│ Full articles issued with    │
│ considered eligible (n= 18) │        │ reasons (n= 7)               │
└─────────────────────────────┘        │ Outcome does not match = 7   │
             │                         │ Article does not match the   │
             │                         │ specified subject = 4        │
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┌─────────────────────────────┐        │ mean SD= 6                   │
│ Articles included in the    │        └──────────────────────────────┘
│ qualitative synthesis (n= 11)│
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│ Articles included in the    │
│ systematic review and meta- │
│ analysis (n= 10)            │
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Figure 1. PRISMA Flow Diagram Research

Articles that met the qualitative requirements were reviewed again and one article was removed because it did not include the mean after treatment and the standard deviation (SD) required to determine the effect of the treatment. The final result of the article review process, there are 10 articles that meet the quantitative requirements for a meta-analysis of mindfulness training interventions to reduce burnout levels in doctors.

There are 10 Randomized Controlled Trial (RCT) studies as a source of research, a systematic review and a meta-analysis of mindfulness intervention methods to reduce burnout levels in this study. An overview of the PICO (Population, Intervention, Comparison, Outcome) of the 10 articles used in the systematic review and meta-analysis of this study can be seen in table 1.

Table 1. PICO (Population, Intervention, Comparison and Outcome) of each study

Author (Year)	Country	Study Design	Sample	P (Popu-lation)	I (Inter-vention)	C (Comparison)	O (Outcome)
Schroeder et al. (2020).	The USA	Randomized Controlled Trial.	Intervensi: 16 Kontrol: 17	doctor	Intervention using mindfulness	No intervention using mindfulness	Decreased burnout rates in doctors
Lebares et al. (2019).	The USA	Randomized Controlled Trial.	Intervention : 12 Kontrol: 9	doctor	Intervention using mindfulness	No intervention using mindfulness	Decreased burnout rates in doctors
Lebares et al. (2018)	The USA	Randomized Controlled Trial.	Intervensi: 12 Kontrol: 9	doctor	Intervention using mindfulness	No intervention using mindfulness	Decreased burnout rates in doctors
Goldhagen et al. (2015).	The USA	Randomized Controlled Trial.	Intervensi: 25 Kontrol: 22	doctor	Intervention using mindfulness	No intervention using mindfulness	Decreased burnout rates in doctors
Minichiello et al. (2020).	The USA	Randomized Controlled Trial.	Intervensi: 12 Kontrol: 12	doctor	Intervention using mindfulness	No intervention using mindfulness	Decreased burnout rates in doctors
Yang et al. (2015).	The USA	Randomized Controlled Trial.	Intervention : 40 Control: 39	doctor	Intervention using mindfulness	No intervention using mindfulness	Decreased burnout rates in doctors
Ireland et al. (2017).	Australia	Randomized Controlled Trial.	Intervention : 23 Control: 21	doctor	Intervention using mindfulness	No intervention using mindfulness	Decreased burnout rates in doctors
Verweij et al. (2014).	Netherland	Randomized Controlled Trial.	Intervention : 80 Control: 68	doctor	Intervention using mindfulness	No intervention using mindfulness	Decreased burnout rates in doctors
Amutio et al. (2014).	Spain	Randomized Controlled Trial.	Intervention : 21 Control: 21	doctor	Intervention using mindfulness	No intervention using mindfulness	Decreased burnout rates in doctors
Eriksson et al. (2018).	Sweden	Randomized Controlled Trial.	Intervention : 40 Control: 40	doctor	Intervention using mindfulness	No intervention using mindfulness	

Table 3. Research Quality Assessment (Critical Appraisal)

No	Questions of checklist	Publication (Author and Year)			
		Yang et al. (2015)	Ireland et al. (2017)	Wyse et al (2014)	Yoong et al (2019)
1	Does this study address a clear research focus?	1	1	1	1
2	Is the Randomized Controlled Trial research method appropriate to answer the research question?	1	1	1	1
3	Are there enough subjects in the study to establish that the findings did not occur by chance?	1	1	1	1
4	Were subjects randomly allocated to the experimental and control groups? If not, could this be biased?	1	1	1	1
5	Are inclusion/exclusion criteria used?	1	1	1	1
6	Were the two groups comparable at the start of the study?	0	0	0	0
7	Were objective and unbiased outcome criteria used?	1	1	1	1
8	Are objective and validated measurement methods used in measuring the results? If not, were results judged by someone who did not know the group assignment (ie was the assessment blinded)?	1	1	1	1
9	Is effect size practically relevant?	1	1	1	1
10	How precise is the estimate of the effect? Is there a confidence interval?	1	1	1	1
11	Could there be confounding factors that have not been taken into account?	0	0	0	0
12	Can the results be applied to your research?	1	1	1	1
	Total	10	10	10	10

Note:

Yes = 1

No = 0

a. Funnel plot

The interpretation of the results of the meta-analysis of the 10 primary research articles in this study can be seen in the forest plot image (Figure 2). Based on the results of data analysis using RevMan 5.4.1 software, it is known that the data obtained is homogeneous (I^2= 47%) so that the Fixed Effect Model (FEM) is used.

A funnel plot is a plot that represents the size of the effect of each study on an estimate of its accuracy which is usually the standard error. Mindfulness intervention was effective in reducing burn-out rates in doctors 0.20 units lower than without using mindfulness and the results were statistically significant (SMD -0.20; 95% CI -0.37 to -0.03; p=0.020).
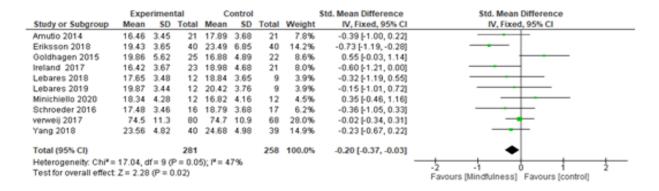
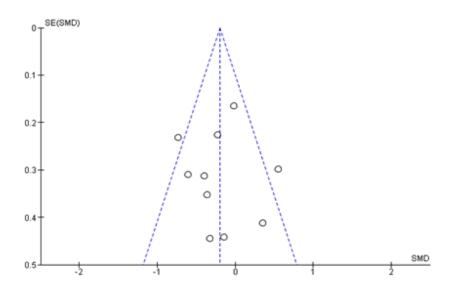| Study or Subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Fixed, 95% CI
Amutio 2014	16.46	3.45	21	17.89	3.68	21	7.8%	-0.39 [-1.00, 0.22]
Eriksson 2018	19.43	3.65	40	23.49	6.85	40	14.2%	-0.73 [-1.19, -0.28]
Goldhagen 2015	19.86	5.62	25	16.88	4.89	22	8.6%	0.55 [-0.03, 1.14]
Ireland 2017	16.42	3.67	23	18.98	4.68	21	8.0%	-0.60 [-1.21, 0.00]
Lebares 2018	17.65	3.48	12	18.84	3.65	9	3.9%	-0.32 [-1.19, 0.55]
Lebares 2019	19.87	3.44	12	20.42	3.76	9	3.9%	-0.15 [-1.01, 0.72]
Minichiello 2020	18.34	4.28	12	16.82	4.16	12	4.5%	0.35 [-0.46, 1.16]
Schroeder 2016	17.48	3.46	16	18.79	3.68	17	6.2%	-0.36 [-1.05, 0.33]
verweij 2017	74.5	11.3	80	74.7	10.9	68	28.0%	-0.02 [-0.34, 0.31]
Yang 2018	23.56	4.82	40	24.68	4.98	39	14.9%	-0.23 [-0.67, 0.22]
Total (95% CI)			**281**			**258**	**100.0%**	**-0.20 [-0.37, -0.03]**

Heterogeneity: Chi² = 17.04, df = 9 (P = 0.05); I² = 47%
Test for overall effect: Z = 2.28 (P = 0.02)

Figure 2. Forest Plot

Figure 3. Funnel Plot

The interpretation of the funnel plot results shows that there is no publication bias as indicated by: 1. The plot shape is symmetrical on the right and left sides, 2. The distance between plots is balanced, 3. SE value < 0.5. The description of the funnel plot in this study can be seen in the funnel plot image (Figure 3). The funnel plot image in this study shows that there is no publication bias.

DISCUSSION

Doctors are one of the health workers who have the highest burnout rate, especially doctors who serve as emergency room doctors. According to Schroeder (2016), 60% of doctors who work in the emergency room show symptoms of burnout, including: excessive emotions, decreased self-confidence, and depersonalization disorders. These symptoms will result in a decrease in the quality of care provided to patients, frequent errors in determining treatment plans, and a decrease in patient confidence in the treating doctor (Hofmann et al., 2014).

Burnout in doctors has reached epidemic levels (West, 2016). There are many negative impacts, including: low professionalism, care for patients is not optimal and even prone to errors, doctors' health is disrupted, and the system of care and health

services is disrupted. Schroeder (2016) states that burnout also causes large financial losses to doctors, amounting to 25,000 US dollars, decreases self-quality, and causes early retirement. Proper handling for doctors to prevent burnout is very necessary so that the negative impacts it can cause can be prevented, one method that can be used is mindfulness.

Mindfulness is a method that aims to increase concentration, increase self-awareness, more controlled emotions, so that according to several studies can reduce stress and fatigue that occurs in doctors. Mindfulness can be used flexibly, portable and non-invasively, designed to be as attractive as possible to busy practitioners. Mindfulness has been proven in several studies to be an effective method in reducing the negative effects of burnout. Previous study has shown mindfulness has been successful in reducing stress in some populations. Therefore mindfulness can also be used to reduce burnout, stress, depression and fatigue due to the workload of doctors (Dunne et al., 2019).

This systematic review and meta-analysis research takes the topic of mindfulness interventions to reduce burnout levels in doctors, where the independent variable in this study is mindfulness and the dependent variable in this study is the burnout level of doctors. Confounding factors are things that cannot be avoided in a study, but can be controlled.

Confounding factors affect the relationship and effect of exposure to disease events estimated (estimated) by studies that are not the same as the relationship or effect that actually occurs in the target population, aka the study results are invalid (incorrect) (Murti, 2018)

In this systematic study and meta-analysis using research that controls confounding factors, this can be seen from the

inclusion and exclusion requirements required in this study, so that they can control confounding factors that can make this study invalid. There are 10 articles that have passed the inclusion and exclusion requirements of a number of primary studies that were included in this systematic review and meta-analysis. The number of respondents, the mean and standard deviation (SD) values were combined and processed using the RevMan 5.4.1 application.

The effect of intervention for fatigue, stress and burnout on doctors according to several previous studies did not depend on the doctor's career stage, last education level, and the format used to provide the intervention. The decrease in burnout in doctors using the mindfulness method in several journals showed an average of 2-3 months after the intervention was given. The number of relevant research published and accessible is still small and also has data access problems (data duplication) (Murti, 2018).

The results of data processing using the RevMan 5.4.1 application in this study with 10 articles from the United States, Australia, the Netherlands, Spain, and Sweden showed that the provision of mindfulness training interventions was effective in reducing burnout rates in doctors 0.20 units lower than without using mindfulness and results were statistically significant (SMD -0.20; 95% CI -0.37 to -0.03; p=0.020).

This study is supported by Spinelli et al (2019) which states that mindfulness effectively and statistically significantly affects the reduction of burnout and the quality of life of medical and health workers, including: doctors, nurses, physiotherapists, laboratory personnel. This study was conducted using a meta-analysis of 40 RCT journals with a total of

2505 subjects, with 75% female data. The decrease in burnout shows statistically significant results.

Another study conducted by Luken and Sammons (2016) showed that it was statistically significant to reduce burnout in medical personnel and teachers. The study was conducted on 8 articles. The results showed that after the mindfulness intervention, medical personnel and teachers showed a decrease in burnout and an increase in psychological and cognitive abilities. This is supported by Lanz et al (2019) on an intervention using a mindfulness application on a mobile phone which is statistically effective in reducing burnout levels in professional workers in the UK.

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