

Effectiveness of Physical and Psychological Treatment for Cancer-Related Fatigue: Systematic Review

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ABSTRACT

Cancer is the second leading cause of death worldwide. Fatigue is one of the most common side effects of people with cancer. The range of people with cancer who experience fatigue is 70-80%, when undergoing cancer treatment and during the phase before and after treatment. This systematic review aims to identify fatigue management with non-pharmacological intervention. The journals selected from 2015 to 2020 in an international database: Pubmed, SAGE journals, Microsoft Academic, and Science Direct. The database searched using the keywords "exercise treatment" OR "psychological treatment," AND "fatigue" OR "cancer-related fatigue," AND "during cancer treatment" OR "after cancer treatment." Assessment of Critical quality appraisal uses tools from the JBI (Joanna Briggs Institute) critical assessment checklist. The method of analysis used the descriptive method. The results of the Systematic review found 13 journals that met the inclusion criteria, the total sample was 1365 respondents with an average age of 56.85, and the consequences of female respondents were 857 respondents, and male respondents were 464 respondents. Physical treatment and psychological treatment can reduce cancer fatigue before and after treatment. The interventions given both physical treatment and psychological treatment have their benefits and vary in their effectiveness.

Keywords: cancer-related fatigue, fatigue, physical treatment, psychological treatment

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INTRODUCTION

Cancer is the second leading cause of death worldwide, based on data from the Global Cancer Observatory (Globocan) in 2018, the number of new cancer cases was more than 18 million cases, and the

number of deaths was more than 9 million deaths (Akaza, 2019). Based on data from Basic Health Research (Riskesdas) in 2018, there was an increase in the prevalence of Indonesian cancer based on 2013, is 1.4% to 1.8% in 2018, Central Java is in the tenth position with a

prevalence of 2.1% and there is no significant increase or decrease between 2013 and 2018 (Riskesdas, 2018). Fatigue is one of the most common side effects of people with cancer. The range of cancer patients who experience fatigue is 70-80%. Among other things, when undergoing radio treatment, chemo treatment and cancer treatment, and during the phase before and after treatment (Charalambous et al., 2019).

Research shows that cancer patients who experience fatigue can impact the activities of daily life and affect the quality of life of cancer patients. Besides, cancer patients who experience continuous fatigue have a higher risk of death than patients who have never experienced fatigue (the risk of death reaches 2.56 times). Fatigue also has a significant impact on patients' working lives, based on 75% of 177 patients reporting have changed their employment status due to fatigue (Aapro et al., 2017).

The results showed that physical exercise, psychological treatment, and physical exercise with psychological therapeutic interventions effectively reduced cancer-induced fatigue during and after primary care, while pharmacological interventions were ineffective in reducing cancer-induced fatigue. Physical exercise interventions and psychological treatment were significantly more effective at reducing fatigue levels than overall pharmacological interventions (Mustian et al., 2017). Although physical exercise and nonpharmacological treatment are effective in reducing cancer-induced

fatigue (Hilfiker et al., 2018). Based on the description above, it is necessary to conduct a literature review that aims to identify fatigue management with non-pharmacological interventions such as physical exercise treatment and psychological treatment, which are most effective in managing fatigue due to cancer during cancer treatment and after cancer treatment.

METHODS

The writing design is a Systematic Review. The systematic review uses a protocol and evaluation, which is PRISMA, to determine the completion of studies found and adapted to the objectives of the systematic review.

Data sources and screening process

The data used in this research is secondary data obtained from the results of the study conducted by previous researchers, using four databases is: Pubmed, SAGE journals, Microsoft Academic, Science Direct. Searching for articles and journals in this review systematic review uses keywords and Boolean operators (AND, OR NOT or AND NOT) (Zohuri and Moghaddam 2017). Is by keywords “exercise treatment” OR “psychological treatment,” AND “fatigue” OR “cancer-related fatigue,” AND “during cancer treatment” OR “after cancer treatment.” The strategy used to search for articles and journals is using the PICOS framework (Saaq and Ashraf, 2017).

Table 1. Inclusion and exclusion criteria of the studies in the systematic review

Criteria	Inclusion	Exclusion
Patient Population	Studies comprised communities with Cancer	affected Communities not affected Cancer
Intervention	Non-pharmaceutical intervention,	Pharmaceutical treatment

Criteria	Inclusion	Exclusion
	such as exercise treatment and psychological treatment	
Comparative controls	No comparative	
Outcomes	The effectiveness of nonpharmacological treatment for cancer related fatigue	Not described the effectiveness of nonpharmacological treatment for cancer related fatigue
Statistical analysis	Randomized control and trial.	Systematic review, meta-analyses, A Quasi-experimental study, cross-sectional studies. and qualitative research
Publication years	2015-2020	Before-2015
Language	English	Language other than English

Data extraction

Based on the literature searches through publications in four databases and using keywords adjusted to the keywords and Boolean Operators, the researchers found 2664 articles that match these keywords. The search results obtained rechecked, the researcher then analyzes based on the title to get the abstract results reviewed with an assessment based on the eligibility of the inclusion and exclusion criteria, as many as 1711 articles not included in the outcomes criteria, 519 papers not included in the intervention criteria, 227 reports Not included in the standards for the patient population, 157 articles not included in the requirements for statistical analysis, 1 article found in Indonesian. Finally, there were 49 articles for abstract analysis.

Quality assessment

The analytical method used in this systematic review is a descriptive method based on a theme determined in the systematic review. The study uses descriptive analysis that describes and explains through tables and narratives about the research results described in the literature—data analysis methods using data extraction formats. Assessment of Critical quality appraisal uses tools from the JBI (Joanna Briggs Institute) critical assessment checklist. Assessment criteria score of "yes," "no," "unclear," and "not valid," each measure with the result of "yes" is given one point, and the score for the other criteria is zero, each score calculated and added up. If the results of the study at least 50% meet the Critical appraisal criteria with the cut-off point value agreed upon by the researcher, the study included in the inclusion criteria (Higgins et al., 2019).

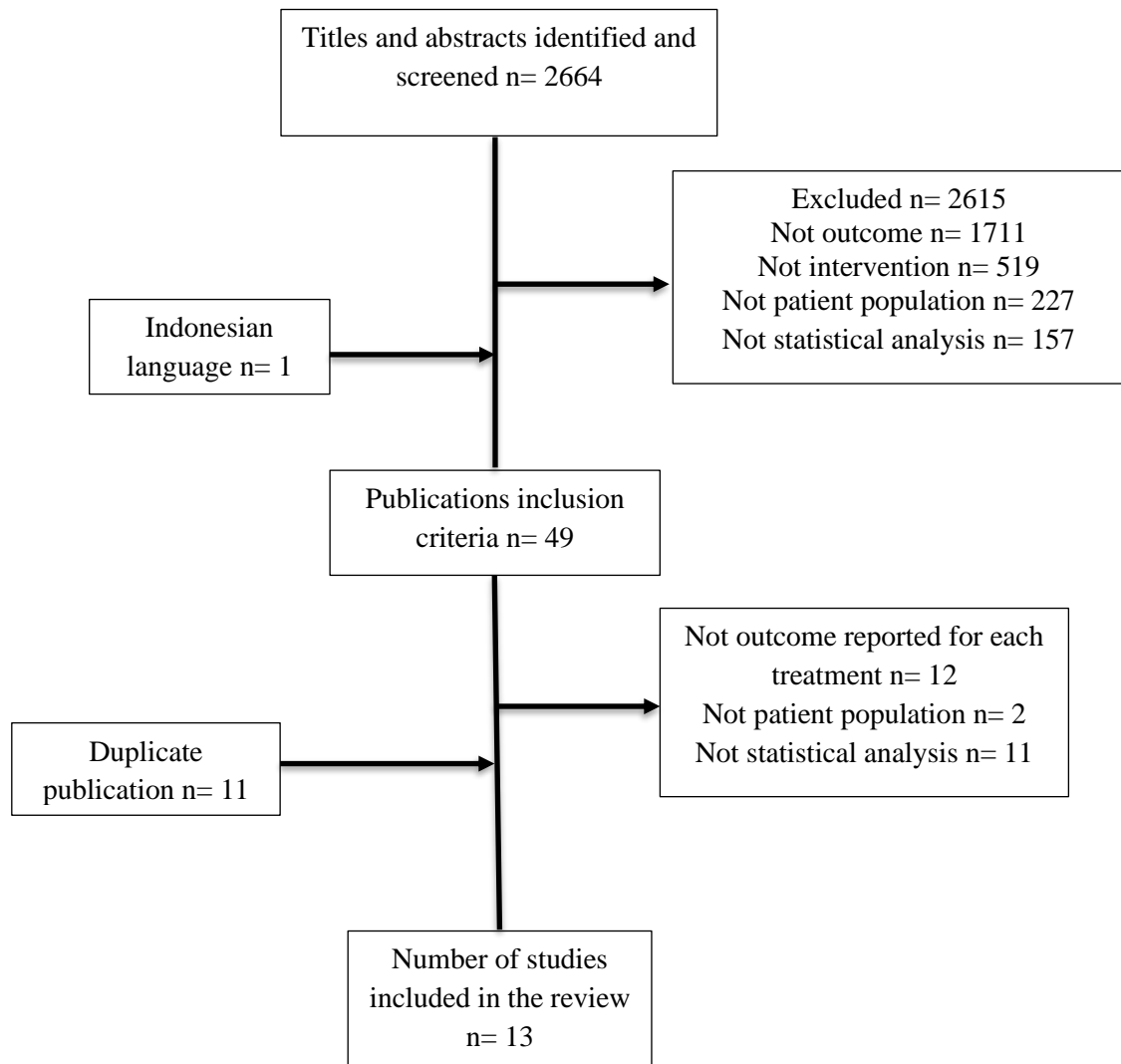


Figure 1. PRISMA Flow

The researcher then analyzed 49 articles based on abstract tracing and obtained 11 duplication articles, duplication analysis using Mendeley software with Check for Duplicates tools. The remaining 38 articles will be analyzed based on the abstract using a form consisting of problems, objectives, methods, and research results. The

analysis results based on the abstract found 12 articles do not match the outcome criteria to be analyzed, two papers do not match the patient's requirements to explored, and 11 articles do not fit the criteria for statistical analysis. The results were 13 articles that continued into full text.

RESULTS AND DISCUSSION

Respondent characteristics

Respondents in this study were all patients diagnosed with cancer in each country, with a total of 1564 respondents.

Respondents in this study had an average age of 40 to 67.9, with an average age of all respondents is 56.85. The gender characteristics of the respondents in this study were more female respondents than male respondents, with the results of female respondents totaling 857 respondents and male respondents totaling 464 respondents.

Table 2. Characteristic of the Study

No	Component	(Lin et al. 2019)	(Amy J. Hoffman et al. 2017)	(Schuler et al. 2017)	(Lu et al. 2019)	(Bryant et al. 2018)	(Dhillon et al. 2017)	(Lundt and Jentschke 2019)	(Zhang et al. 2016)	(Hojan, Kwiatkowska-Borowczyk, et al. 2016)	(Poort et al. 2020)	(M E Mendoza et al. 2017)	(Charalambous et al. 2016)	(Johns et al. 2015)	Result/mean
1	Demographics of data	358	72	70	77	17	111	58	91	54	134	44	208	71	1365
2	Age (average)	54,3	67	52,38	54,63	40,4	64	58,19	60	67,9	62,71	60,95	40	56,6	56,85
3	Gender														
	Male	14	32	41	56	12	61	6	68	-	57	5	104	8	464
	Female	344	40	29	31	5	50	52	23	-	77	39	104	63	857
4	Job Status														
	Work	292	20	-	-	-	-	-	-	-	41	18	-	35	406
	Retired	-	40	-	-	-	-	-	-	-	54	5	-	-	99
	Does not work	-	12	-	-	-	-	-	-	-	31	21	-	-	64
	Other	-	-	-	-	-	-	-	-	-	8	-	-	36	44
5	Types of cancer														
	Ginekologi	291	-	6	-	-	-	36	-	-	60	29	104	34	560

No	Component	(Lin et al. 2019)	(Amy J. Hoffman et al. 2017)	(Schuler et al. 2017)	(Lu et al. 2019)	(Bryant et al. 2018)	(Dhillon et al. 2017)	(Lundt and Jentschke 2019)	(Zhang et al. 2016)	(Hojan, Kwiatkowska-Borowczyk, et al. 2016)	(Poort et al. 2020)	(M E Mendoza et al. 2017)	(Charalambous et al. 2016)	(Johns et al. 2015)	Result/mean
	Hematologi	25	-	17	-	17	-	8	-	-	4	3	-	-	74
	Head, neck, and neurologi	-	-	28	-	-	-	3	91	-	-	2	-	-	124
	Sistem pencernaan	21	-	11	-	-	-	5	-	-	34	-	-	37	108
	System nefrologi	-	-	-	-	-	-	4	-	-	36	2	104	-	146
	Other	21	-	-	-	-	-	-	-	-	-	8	-	-	29
	Cancer Stage														
	Stage 0	17	-	-	-	-	-	-	-	-	-	-	-	10	27
	Stage I	127	60	-	23	-	-	-	3	-	-	-	-	21	234
	Stage II	122	2	-	55	-	-	-	8	-	-	-	-	10	197
	Stage III	57	-	-	9	-	-	-	21	-	-	-	-	30	117
	Stage IV	10	10	-	-	-	-	-	59	-	-	-	-	-	79
	Unknown	25	-	-	-	-	-	-	-	-	-	-	-	-	25
	Treatment														
	Operation	-	-	-	-	-	-	-	-	-	-	-	61	10	71
	Chemotreatment	-	-	-	-	-	-	-	-	-	66	-	96	20	182

No	Component	(Lin et al. 2019)	(Amy J. Hoffman et al. 2017)	(Schuler et al. 2017)	(Lu et al. 2019)	(Bryant et al. 2018)	(Dhillon et al. 2017)	(Lundt and Jentschke 2019)	(Zhang et al. 2016)	(Hojan, Kwiatkowska-Borowczyk, et al. 2016)	(Poort et al. 2020)	(M E Mendoza et al. 2017)	(Charalambous et al. 2016)	(Johns et al. 2015)	Result/mean
	Radiation treatment	-	-	-	-	-	-	-	-	-	-	-	51	41	92
	Hormonal treatment	-	-	-	-	-	-	-	-	-	44	-	-	-	44
	Immunotreatment	-	-	-	-	-	-	-	-	-	5	-	-	-	5
	Targeted treatment	-	-	-	-	-	-	-	-	-	14	-	-	-	14
	Drug	-	-	-	-	-	-	-	-	-	1	-	-	-	1

The characteristics of the disease of the study are the type of cancer, stage of cancer, and type of treatment. Types of cancer are gynecology is 560 respondents, hematology is 74 respondents, types of cancer in the head and neck and the neurological system as many as 124 respondents, cancer in the digestive system as many as 108 respondents, cancer in the nephrology system as many as 146 respondents, and other types of cancer as many as 29 respondents. The characteristics of cancer stage are stage 0 is 27 respondents, stage I is 234 respondents, stage II is 197 respondents, stage III is 117 respondents, stage IV is 79 respondents, and

unknown is 25 respondents. The characteristics of the type of treatment, including surgery, is 71 respondents; chemo treatment is 182 respondents, radiation treatment is 92 respondents, hormonal treatment is 44 respondents, immune treatment is five respondents, targeted treatment is 14 respondents, drug treatment is one respondent, unknown treatment is two respondents.

The following table is Study Result that include author name and year, study design, participants, duration, instrument and intervention, summary and conclusions for each journals.

Table 3. Study Result

No	Author and year	Study design	Participants	Duration	Instrumen / Intervention	Summary of results / conclusions
1	(Lin et al. 2019)	A randomized controlled trial	YOCAS 177 participants Standard care services 181 participants	4 weeks	The intervention was Yoga, and the instruments used were the Multidimensional Fatigue Symptoms Inventory (MFSI) before and after the intervention.	YOCAS intervention: Before intervention (23.6 ± 1.6), after intervention (13.4 ± 1.6), within-group difference (-9.5 ± 1.2 , $P < 0.01$). Standard service maintenance: Before intervention (23.8 ± 1.7), after intervention (20.2 ± 1.6), within-group difference (-2.7 ± 1.0 , $P = 0.13$). Between-group difference (-6.8 ± 1.4 , $P < 0.01$).
2	(Amy J. Hoffman et al. 2017)	Randomized Controlled Trial	The intervention group (IG) 37 participants Control group (CG) 35 participants	6 weeks	The intervention carried out was Perceived Self-efficacy. The instruments used were the Brief Fatigue Inventory (BFI) and Perceived Self-Efficacy for Fatigue Self-management (PSEFSM).	Before intervention (IG: mean, 2.2 [SD, 2.0]; CG: mean, 2.0 [SD, 1.9]; $t_{70} = 0.44$; $P = .66$; 95% confidence interval [CI], 0.73Y1.14). After GI intervention: mean, 4.1 [SD, 1.9]; CG: mean, 3.9 [SD, 2.7]; $t_{61} = 0.33$; $P = .74$; 95% CI, 0.92Y1.3) for the IG and CG show no significant difference. PSEFSM instrument: Before intervention (IG: mean, 7.4, CG: mean, 8.7), After intervention (IG: mean, 7.0, CG: mean, 7.7).
3	(Schuler et al. 2017)	A Randomized Controlled Trial	Group A (control) 24 patients Group B (self-directed) 23	12 weeks	The intervention carried out was a Different Exercise Program. The instruments used are	Before intervention: General fatigue (A: mean, 10.52 ± 3 , B: mean, 9.95 ± 2.95 , C: mean, 11.59 ± 3.95) After the intervention: General

No	Author and year	Study design	Participants	Duration	Instrumen / Intervention	Summary of results / conclusions
			patients Group C (partially supervised) 23 patients		the Multidimensional Fatigue Symptoms Inventory (MFSI)	fatigue (A: mean, 10.81 ± 3.47 , B: mean, 9.40 ± 4.95 , C: mean, 10.46 ± 5.14)
4	(Lu et al. 2019)	A randomized controlled trial	Baduanjin exercise group (EG) 43 patients Control group (CG) 45 patients	24 weeks	The intervention carried out was the Baduanjin qigong exercise. The instrument used was the Brief Fatigue Inventory (BFI).	Before intervention (EG: mild, 17 (39.5), moderate, 16 (37.2), severe, 10 (23.3). CG: mild, 15 (34.1), moderate, 17 (38.6), severe, 12 (27.3). = 0.850) 12 weeks of intervention (EG: mild, 18 (41.9), moderate, 18 (41.8), severe, 7 (16.3). CG: mild, 17 (38.6), moderate, 17 (38.6), severe, 10 (22.8). P = 0.750) 24 weeks after intervention (EG: mild, 31 (72.1), moderate, 5 (11.6), severe, 5 (11.6). CG: mild, 18 (40.9), moderate, 20 (45.5), severe, 6 (13.6) . P <0.01).
5	(Bryant et al. 2018)	randomized clinical trial	Intervention group (IG) 8 patients Control group (CG) 9 patients	4 weeks	The intervention carried out was the Effect of Exercise Performance-Based Physical Funtion.	Before intervention (IG: 57, EG: 51.5), after intervention (IG: 50.4, EG: 55.6), change (IG: -5.95, EG: 4.1, P=0.11).
6	(Dhillon et al. 2017)	A randomized controlled trial	Exercise group (EX) 56 patients, usual care (UC) 55 patients	8 months	The intervention carried out is Physical Activity. The instrument used was the Functional Assessment of Cancer Treatment-Fatigue (FACT-F) subscale.	Before intervention (EX: 38.43, UC: 36.34), 2 months of intervention (EX: 37.53, UC: 36.36, Estimate 1.17, CI: -3.46, 5.80, P = 0.618), 4 months of intervention (EX: 39.38, UC: 35.33, Estimate 4.05, CI: -0.88, 8.97, P = 0.107), and after 6 months of intervention (EX: 36.67, UC:

No	Author and year	Study design	Participants	Duration	Instrumen / Intervention	Summary of results / conclusions
						34.00, Estimate 2.67, CI: -2.58, 7.92, P = 0.317).
7	(Lundt and Jentschke 2019)	a randomized controlled study	Total 58 patients	6 months	The intervention undertaken is Yoga. The instrument used was the EORTC QLQ-FA13 (European Organization for Research and Treatment of Cancer Quality of Life Questionnaire-Fatigue Scale).	Before and after the intervention (n: 58, mean: 28.30, SD: 8.29, mean: 25.69, SD: 8.03 P = 0.006, SES: -0.31, CI: -0.54 to -0.09).
8	(Zhang et al. 2016)	A randomized controlled trial	Tai Chi intervention group (TC) 47 patients, Control group (CG) 44 patients	2 months	The intervention undertaken was Tai chi. The instrument used was the Multidimensional Fatigue Symptoms Inventory (MFSI).	Before intervention (TC mean (SD): 46.0 (11.6), CG mean (SD): 46.8 (12.2), 6 weeks of intervention (TC mean (SD): 59.5 (11.3), CG mean (SD): 66.8 (11.9) , after 12 weeks of intervention (TC mean (SD): 53.3 (11.8), CG mean (SD): 59.3 (12.2), P <0.05).
9	(Hojan, Kwiatkowska-Borowczyk, et al. 2016)	A randomized clinical study	Intervention group (EG) 27 patients Usual group (UG) 27 patients	8 weeks	The intervention carried out was Physical Exercise. The instrument used was The Functional Assessment of Cancer Treatment-Fatigue (FACT-F).	Before intervention (EG mean (SD): 27.3 (19.7), UG mean (SD): 28.0 (21.9)), after intervention (EG mean (SD): 30.7 (21.4), UG mean (SD): 242.1 (23.6) , mean 3.4 (19.3), P <0.05).
10	(Poort et al. 2020)	a randomized controlled trial	CBT group 46 patients, GET group 42 patients, and usual care	26 weeks	The intervention carried out was CBT. The instrument used was (EORTC-QLQ-C30 or	CBT significantly reduced fatigue at 14 weeks compared with usual care [-7.2, 97.5% confidence interval (CI) -12.7 to -1.7; P ¼ 0.003, d ¼

No	Author and year	Study design	Participants	Duration	Instrumen / Intervention	Summary of results / conclusions
			group (UC) 46 patients		SIP8) as covariates.	0.7]. (UC: mean 38.95 (35.58 to 42.32), CBT: mean 31.72 (28.36 to 35.09), GET: mean 34.25 (30.79 to 37.71, P=0.012).
11	(M E Mendoza et al. 2017)	A randomized controlled trial	CBT intervention group 22 patients, EC intervention group 22 patients	3 method	The intervention undertaken is Hypnosis plus CBT. The instrument used was the Patient-reported Outcomes Measurement Information System (PROMIS).	In pretreatment to post-treatment changes in the primary outcomes, found significantly greater improvements (P < .001) significant between-groups differences emerged for depression (P < .001), cancer distress (P < .001), pain interference (P < .05), and pain catastrophizing (P < .05).
12	(Charalambous et al. 2016)	A randomized controlled trial	Intervention group (IG) 104 patients, control group (CG) 104 patients	4 weeks	The interventions carried out were Guided Imagery and Progressive Muscle Relaxation. The instrument used is The Cancer Fatigue Scale (CFS)	Before intervention (IG: mean 67.8 (19.6), mean CG 73.1 (21.8). After intervention (IG: mean -17.1, P <0.00001), and (CG: mean +7.6, P <0.00001).
13	(Johns et al. 2015)	A randomized controlled trial	The MBSR group was 35 patients, the education support (ES) group was 36 patients	6 months	The intervention undertaken is Mindfulness-based Stress Reduction. The instrument used is The Attentional Function Index (AFI).	No differences emerged between MBSR and ES participants at T2 or T3 (all p>0.64) on Stroop interference scores. between T1 and T2 (p=0.17), MBSR participants had a lower error rate at T3 (MT3=-0.01, SDT3=0.03) relative to T1 (MT1=-0.10, SDT1=0.25; z=-2.12, n=29, p=0.034, r=0.39).

Physical treatment

Physical treatment is an exercise program such as walking, cycling, or running (Schuler et al. 2017). Exercise program for walking and balance training, a program of walking for 30 minutes, heating phase for 5 minutes, brisk walking for 10 minutes, and cool down for 5 minutes are effective in reducing cancer-related fatigue (Amy J Hoffman et al. 2017). Aerobic exercise program and body resistance training (Bryant et al. 2018). Thirty minutes of aerobic exercise (brisk walking, treadmill, or using a bicycle) and 15 minutes of resistance training, research shows that a combination of aerobic exercise and resistance training is effective in reducing fatigue during treatment in a variety of cancer treatments (Hojan, Kowska-Borowczyk, et al. 2016).

Cancer-specific gymnastics education program (move your body), and nutrition (eat for health) (Dhillon et al. 2017). Baduanjin qigong exercise is the first 40 minutes of explaining and demonstrating eight movements and natural breathing methods, and patients practice Baduanjin for five sessions per week for 20-40 minutes (Lu et al. 2019). Tai chi exercises with easy movements is 1) initial form (hands rising to shoulder level), 2) arms arching back, 3) stepping sideways and moving arms, 4) moving hands, 5) diagonal steps, 6) standing with one leg, 7) stepping and pushing, and 8) the form of a cover (hands fall sideways, left foot pulled to right foot). Each session includes 5 to 10 minutes of warm-up, followed by a Tai Chi workout in a practice session (Zhang et al. 2016).

The effect of reducing fatigue on physical exercise was found in the intervention group compared to the control group. Although this study looked at the impact of physical activity in both

the intervention and control groups, a significant change from severe fatigue could only be found in the intervention group. This study indicates that severe fatigue in cancer patients reduced by performing appropriate physical exercise (Schuler et al. 2017). The results of Hoffman's (2017) study are very satisfying because the intervention group found the intervention very acceptable, "fun," "convenient for exercising at home," "easy to use,". When compared with the control group, the intervention group showed initial efficacy in reducing the severity of CRF every week for six weeks of intervention (Amy J Hoffman et al. 2017). Other studies have shown that a combination of aerobic exercise and resistance training is effective in reducing fatigue during treatment in a variety of cancer treatments (Bryant et al. 2018; Dhillon et al. 2017; Hojan, Kowska-Borowczyk, et al. 2016).

This study showed a positive effect in reducing CRF and improving sleep quality. Baduanjin relieved CRF in colorectal cancer patients undergoing chemo treatment. convenient and straightforward method of lowering CRF in patients with colorectal cancer who are undergoing chemo treatment (Lu et al. 2019). The results show that Tai Chi is an effective intervention for managing fatigue in pulmonary patients undergoing chemo treatment, significantly to reduce fatigue and increase strength (Zhang et al. 2016). The physical exercise intervention was significantly effective at reducing CRF during and after cancer treatment (Mustian et al. 2017). The results suggest exercising during chemo treatment is a promising strategy for minimizing treatment-related side effects, both short and long term (Witlox et al. 2018).

Psychological treatment

Yoga treatment 60 minutes each week for eight weeks (Lundt and Jentschke 2019). Yoga consists of breathing exercises, physical alignment postures, and mindfulness exercises, sessions lasting 75 minutes per week for four weeks (Lin et al. 2019). CBT (Cognitive Behavior Treatment) for 1 hour in 12 weeks, and GET (Guided Exercise Treatment) exercises consist of an aerobic exercise program for 2 hours in 12 weeks (Poort et al. 2020). Programs combine self-hypnosis training with CBT (M. E. Mendoza et al. 2017).

A two-minute breathing exercise intervention, followed by a 10-minute progressive muscle relaxation exercise and a 15-minute guided imagery session. Progressive Muscle Relaxation. Progressive Muscle Relaxation is a nursing intervention of the Nursing Intervention Classification (NIC), is defined as facilitating the successive tension and release of muscle groups while noticing the resulting difference in sensation over four weeks (Charalambous et al. 2016). The MBSR (Mindfulness-based stress reduction) and ES (Education Support) interventions consist of two-hour classes each per week led by a skilled facilitator following standard procedures (Johns et al. 2015).

Research shows that Hatha-based and Restorative yoga treatment is effective for treating CRF in people with cancer. The results also indicated that 22% of the YOCAS effect on CRF was associated with improved overall sleep quality (Lin et al. 2019). The results showed that yoga exhibited moderate to large effect sizes in reducing fatigue compared to conventional treatments (Hilfiker et al. 2018).

The Guided Imagery and Progressive Muscle Relaxation intervention, showing a statistically significant reduction in fatigue felt after

the intervention, data analysis revealed a statistically significant decrease in perceived fatigue after the intervention. This decrease reflected in the physical, affective, and cognitive subscales of the cancer fatigue scale (Charalambous et al. 2016). The Guided Imagery and Progressive Muscle Relaxation intervention, showing a statistically significant reduction in fatigue felt after the intervention, data analysis revealed a statistically significant decrease in perceived fatigue after the intervention. This decrease reflected in the physical, affective, and cognitive subscales of the cancer fatigue scale (Johns et al. 2015). Small to moderate effect sizes on reducing fatigue found for the CBT combination (Hilfiker et al. 2018). Psychological interventions were significantly effective at reducing CRF during and after cancer treatment (Mustian et al. 2017).

CONCLUSION

The type of physical treatment that is most effective in reducing symptoms of fatigue is the combination of resistance training and aerobic exercise. The effect of physical treatment can reduce signs of fatigue in cancer patients during and after treatment. Some interventions are physical treatment and psychological treatment, and physical treatment includes Different Exercise programs, Perceived Self-efficacy, Physical Activity, aerobics, Physical Exercise, Exercise Behaviors, Walking Exercise Program, Baduanjin qigong exercise, and thai chi.

The type of psychological treatment most effective in reducing symptoms of fatigue is Yoga for Cancer Survivors. Psychological treatment can also reduce signs of fatigue in cancer patients during and after treatment. Several interventions are Yoga, YOCAS (The Yoga for Cancer Survivors), Cognitive-behavioral treatment or graded exercise treatment

compared with usual care, Hypnosis plus CBT, Guided Imagery, and Progressive Muscle Relaxation, Mindfulness-based stress reduction.

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