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Review Article

Effects of Progressive Muscle Relaxation on Anxiety and Sleep Quality in COVID-19 Patient: A Systematic Review

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ABSTRACT

COVID-19 is an infectious disease. COVID-19 patients will experience anxiety, thus disturbing the patient's sleep quality. Pharmacological therapy given in the long term poses a risk to the health of the body. This study aims to determine the effectiveness of progressive muscle relaxation in COVID-19 patients to reduce anxiety and improve sleep quality. The studies were identified systematic by searching the database with the keywords "COVID-19 AND Anxiety AND Sleep Quality AND progressive Muscle Relaxation." The results consist of Web of Science 3 articles, Scopus 3 articles, Science Direct 135 and Pro Quest 501 articles. Eligible articles were selected according to the inclusion and exclusion criteria, COVID-19 patients with anxiety and sleep disturbances as well as with PMR intervention and articles published in English based on the last 3 years study. In assessing the bias and methodological quality of this study using the Joanna Briggs Institute (JBI) critical appraisal checklist tool. From 642 references, after a selection there were 5 references describing in detail progressive muscle relaxation exercises that could be used together with pharmacological during treatment in isolation rooms. Progressive muscle relaxation exercises are performed 2 times a day, in the morning and before going to bed, with a duration of 20-30 minutes. Progressive muscle relaxation significant reduces anxiety and improves sleep quality in COVID-19 patients during isolation treatment.

Keywords : COVID-19, Anxiety, Sleep Quality, Progressive Muscle Relaxation

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INTRODUCTION

Globally, cases of COVID-19 are increasing every day. As of February 4, 2022, there were 386,548,962 confirmed cases of COVID-19, including 5,705,754 deaths, the World Health Organization reported[1.] Uncertainty and fear of illness can cause anxiety so that patients experience sleep disturbances and a psychological burden on a large number of individuals, including patients with COVID-19 [2]. Sleep disturbances appear to be common during the ongoing COVID-19 pandemic. In addition, sleep disturbances were found to be associated with higher levels of psychological distress, with the use of effective programs to treat sleep problems, psychological stress can be reduced [3].

To treat sleep disorders, drugs have been used. However, long-term use of sleeping pills or pharmacological interventions may have side effects, and their effectiveness and safety in improving sleep quality [4]. Symptoms are mild in the early stages, but can suddenly worsen after a few days, the use of benzodiazepine-type sleeping drugs can cause respiratory depression and delay the observation of the disease.

Non-pharmacological interventions should be provided as an alternative method to improve sleep quality in patients with COVID-19 [5]. One qualitative study stated that non-pharmacological interventions, progressive muscle relaxation, have become the most frequently used method to improve sleep quality[5]. Progressive muscle relaxation (PMR) is a deep relaxation technique that has been effectively used to control stress and anxiety, relieve insomnia, and reduce symptoms of certain types of chronic pain. Progressive Muscle Relaxation (PMR) is performed in a sitting or sleeping position so it can be done anywhere.

Based on clinical observation, the majority of patients experienced anxiety and sleep disturbances during isolation treatment. Patients who experience anxiety lead to

decreased immunity[6]. Anxiety, as a type of psychological stress, will trigger a series of physiological events and cause a decrease in immunity. Progressive muscle relaxation is easy to do independently, does not require a certain time and place, and does not require special technology and equipment [7]. Therefore, this study aims to explain in detail through a systematic review of progressive muscle relaxation interventions on sleep quality and anxiety in COVID-19 patients based on the last 3 years study.

METHOD

The literature search process was carried out in the last 3 years of research 2019-2021 in English selected from several indexed electronic databases such as, Web of Science, Scopus, ScienceDirect, and Pro Quest as well as writing article search results following appropriate protocols and rules using Preferred Reporting Items for Systematic Review and Meta-analysis (PRISMA) checklist and flow diagrams.

Search Strategy

The literature search was carried out in January 2022. The strategy used to find articles was using the PICOS framework. Articles are identified with the keywords "Covid 19 AND Anxiety AND Sleep Quality AND Progressive Muscle Relaxation" by restricting 2019-2021 in English and full text articles, so as to get relevant articles.

Inclusion/Exclusion Criteria

The inclusion criteria for this article are progressive muscle relaxation interventions to treat anxiety and sleep quality in COVID-19 patients who are undergoing isolation treatment, where the population is COVID-19 patients. The articles taken are the last 3 years using RCT, experimental and Clinical observation study methods. The purpose of this study was to examine the effectiveness of progressive muscle relaxation carried out to treat anxiety and sleep quality in COVID-19 patients in detail, so that articles without full text and not explaining the effect of progressive muscle relaxation carried out to treat anxiety and sleep quality in COVID-19 patients were excluded. with study limit 2019-2021. The search results obtained 5 selected articles from 642 articles found from the database that matched the inclusion and exclusion criteria (Table 1).

Table 1. The PICOS Format of this study

PICOT Framework	Inclusion and Exclusion Criteria
Population	COVID-19 patient
Intervention	Progressive Muscle Relaxation (PMR)
Comparison	No comparison intervention
Outcomes	Experience minimal anxiety and good quality sleep.
Time	2019-2022
Study Design	RCT, experimental and Clinical observation study
Language	English
Exclusion criteria:	Articles that do not discuss PMR in COVID-19 patients who experience anxiety and sleep disturbances, articles without full text and abstract without intervention details, dated before 2019, and studies conducted in a language other than English, as well as Experimental Studies, Observational Studies and RCT designs are exception.

Study Selection

The total number of articles identified is 642. Then duplicate removal was done and there were 184 articles left for feasibility review. Articles are screened based on title identification and inclusion and exclusion criteria. Full text article feasibility test remains 5 research articles for review (Figure 1).

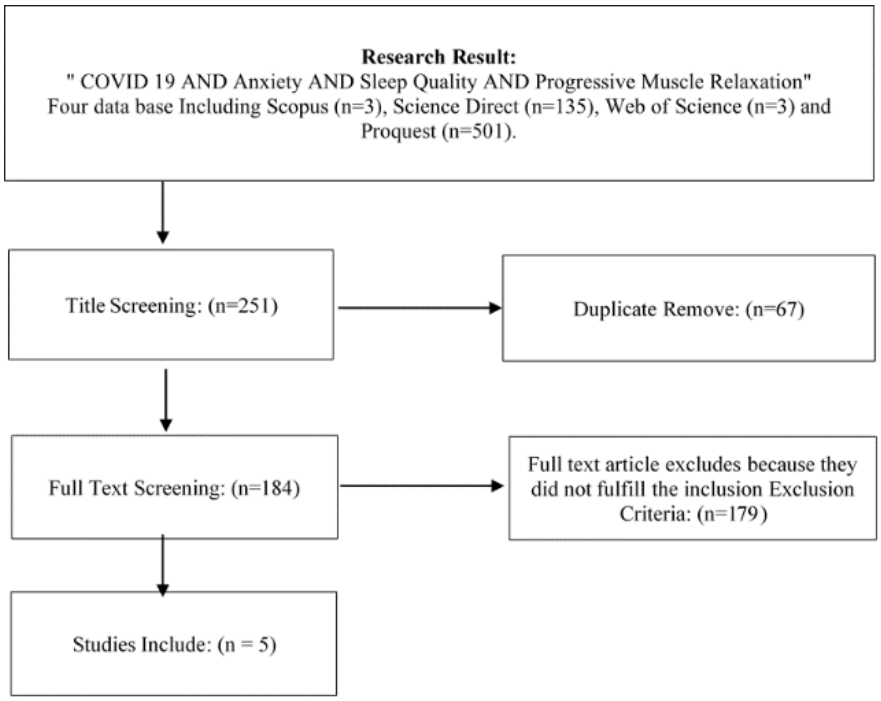

Figure 1. Flowchart of the Articles Selected for the Systematic Review and the Selection Process Using PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyzes).

Data Extraction

The following information was extracted from the 5 articles: information on the demographics, study design, outcome measures, sample size, used evaluation instrument, duration intervention, country and year of publication.

RESULTS

General Features and Types of Study

All articles searched using electronic database Scopus (n=3), Science Direct (n=135), Web of Science (n=3) and Proquest (n=501). 5 articles matched the inclusion and exclusion criteria, with a publication year limit of 2019-2021. Articles in 2020 amounted to 3 (60%), and the publication year 2021 amounted to 2 (40%). Published articles come from Turkey 1 (20%), Iran 1 (20%), China 2 (40%) and Egypt 1 (20%). Research design of each study Clinical observation study 1 (20%), Randomized controlled clinical trial 2 (40%) and Experimental study/Quasi Experimental 2 (40%) (Table 2).

Table 2. General characteristics of the selected studies (n=5)

Characteristics	n	%
Year of publishing		
2020	3	60
2021	2	40
Country		
Turkey	1	20
Iran	1	20
China	2	40
Egypt	1	20
Type of study		
Clinical observation study	1	20
Randomized controlled clinical trial	2	40
Experimental study/Quasi Experimental	2	40

All studies after the analysis explained in detail that the Progressive Muscle Relaxation (PMR) exercise intervention in COVID 19 patients who underwent isolation treatment and experienced anxiety and experiencing anxiety and poor sleep quality was shown to be

effective, with an average sample of > 50 COVID 19 patients. The research sample in each study was >18 years old and children aged 5 -10 years. The PMR intervention was provided through nurse training using CD, video and audio media methods.

PMR is carried out routinely for up to 5 days with a duration of 20 -30 minutes and is carried out in the morning and before going to bed. The patient is in a supine and relaxed position, the action can be performed for 10-15 seconds, and the relaxation process can be 15-20 seconds, At the same time, the patient takes a deep breath, inhales through the nose, and exhales through the mouth. (Table 3).

Table 3. Summary of Selected Studies

Author (Source)	Country	Design	Sample	Instruments	Media/ Duration	Variables	Results
Özlü İ, Öztürk Z, Karaman Özlü Z, Tekin E, Gür A (2021) [8]	Turkey	Experimental study	67 patients	1.The Richards–Campbell Sleep Questionnaire (RCSQ) 2. The State-Trait Anxiety Inventory (STAI)	CD/ TV 2 x A Day For 5 days, Time: 20 – 30 Minutes	Anxiety, COVID-19, Progressive muscle relaxation exercises, Sleep quality	The progressive muscle relaxation exercises effectively reduced the anxiety and improved the sleep quality of patients with COVID-19.
Harorani M, Davodabady F, Masmouei B, Barati N (2020) [9]	Iran	A randomized clinical trial	80 patients	1. STAI questionnaire 2. SMHSQ questionnaire	Training 2 xsehari For 3 days, Time : 20 – 30 Minutes	Anxiety, Sleep quality, Progressive Muscle Relaxation	Relaxation as a complementary method can be used along with modern medicine to reduce anxiety and improve sleep quality in burn patients.
Liu K, Chen Y, Wu D, Lin R, Wang Z, Pan L (2020) [10]	China	A randomized clinical trial	51 patients	1. State-Trait Anxiety Scale (STAI) 2. Sleep State Self-Rating Scale (SRSS)	Training 2 x a day during the day and Before going to bed, Time 20 – 30 Minutes, 5 Days in a row.	Progressive muscle relaxation COVID-19 Anxiety Sleep quality	Progressive muscle relaxation as an auxiliary method can reduce anxiety and improve sleep quality in patients with COVID-19.
Xiao CX, Lin YJ, Lin RQ, Liu AN, Zhong GQ, Lan CF (2020) [12]	China	A clinical observational study	79 patients	1. The Pittsburgh sleeps quality index scale (PSQI) 2. The Generalized anxiety disorder (GAD-7). 3. The patient health questionnaire (PHQ-9)	Vidio/Audio2x Day, Morning and Before Bed. Time: 30 minutes.	COVID-19 patients, negative emotions, progressive muscle relaxation training, sleep quality	Progressive muscle relaxation training can significantly reduce anxiety and depression and improve sleep quality in COVID-19 patients during isolation treatment. Progressive muscle relaxation training was shown to improve the treatment effect of patients and is worthy of clinical promotion.
Ayed manal mohamed, Farrag J, Mahmoud	Egypt	A quasi-experimental	50 patients	1. the scores of sleep quality (PSQI)	Vidio/Audio2x Day, Morning and Before Bed.	Anxiety, Children with COVID-19,	Progressive muscle relaxation technique implementation

Author (Source)	Country	Design	Sample	Instruments	Media/ Duration	Variables	Results
S, Abu Salem EM, Ali Hegazy A, Mahmoud T (2021) [21]				2. STAIC	Time: 30 minutes.	Sleep quality, Progressive muscle relaxation.	was an effective and safe non-medical intervention used for improving anxiety level and quality of sleep among children diagnosed with COVID-19.

Data collection tools/ Instrument Evaluation

Studies from Turkey, Iran, and China used instruments to evaluate anxiety using *State-Trait Anxiety Inventory* (STAI). State-Trait Anxiety Inventory (STAI) is a commonly used measure of trait and state anxiety. The Spielberger State-Trait Anxiety Inventory (STAI) has been widely used to measure the state and trait components of anxiety. The STAI has been shown to have excellent psychometric properties with good reliability. The questionnaire can measure anxiety both in healthy and in clinical populations. The questionnaire can discriminate between individuals diagnosed with an anxiety disorder and nonclinical controls [11].

Studies from Egypt, China in the use of instruments to measure the outcome of a patient's sleep quality intervention using *The Pittsburgh sleeps quality index scale* (PSQI) [12]. Despite the prevalence of sleep complaints among psychiatric patients, few questionnaires have been specifically designed to measure sleep quality in clinical populations. The Pittsburgh Sleep Quality Index (PSQI) is a self-rated questionnaire which assesses sleep quality and disturbances over a 1-month time interval. Nineteen individual items generate seven "component" scores: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction [7]. In assessing bias and methodological quality this systematic review used the Joanna Briggs Institute (JBI) critical appraisal checklist tool. The risk of internal bias from each study after a critical appraisal is carried out with an average value of > 80%, this shows that the study is worthy of being used as a systematic review in making this systematic review article (Figure 2).

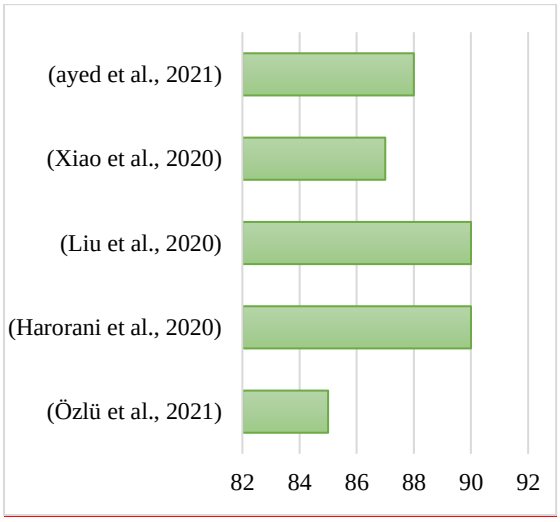

Figure 2. Risk of bias

DISCUSSION

One way to deal with the spread of COVID-19 is by doing isolation. Isolation treatment is the most effective protective measure [7]. To prevent the wider spread of COVID 19, confirmed cases will be given isolation treatment after being confirmed positive for COVID 19 [13]. Isolated COVID-19 patients often experience psychological stress reactions to various factors [14]. When focusing on clinical COVID-19 prevention and control, our attention should also be paid to psychological interventions for different groups of people[15].

Currently, non-drug intervention methods, have been increasingly applied in clinical practice by researchers. Therefore, Progressive Muscle Relaxation (PMR) exercises can be used as a non-pharmacological intervention for psychological intervention in COVID-19 patients. There is no approved drug to aid recovery from COVID-19; Treatment management is based on each patient's signs and symptoms. WHO recommends applying empiric antimicrobial therapy and applying mechanical ventilation based on the patient's clinical diagnosis [16]. According to one study,

progressive muscle relaxation can help reduce stress for COVID-19 patients. Based on the results of observations and medical diagnoses, some patients with coronavirus disease experience sleep disturbances and anxiety after isolation therapy. Anxiety occurs due to psychological stress, so that it triggers decreased immunity and physiological disorders [6].

Progressive muscle relaxation (PMR) techniques are widely used today as a treatment option to reduce anxiety and depression [17]. Edmund Jacobson invented the progressive muscle relaxation technique (PMRT) in the 1920s as a way to help patients cope with anxiety and could relax muscles and relax the mind [18]. Progressive muscle relaxation (PMR) training reduces anxiety in patients, because there is a balance between the hypothalamic nuclei, by reducing sympathetic nerve activity, stress and anxiety can be prevented, and physical and mental relaxation can be increased [19]. Psychological effects of relaxation: Relaxation has a significant psychological impact; Through relaxation we can improve certain aspects of our personality, strengthen positive qualities and change unwanted habits and attitudes [17].

In addition, the results of the study explain that PMR has a statistical significance on sleep quality, where there is an increase in sleep quality in COVID-19 patients who are undergoing isolation treatment with progressive muscle relaxation therapy. However, these results contradict those of Zupanec et al. study, in which they found that PMR had no statistical significance on children's sleep quality, despite an increase in sleep duration and a decrease in the frequency of waking at night[20]. But this can be refuted by recent studies regarding PMR interventions given to children with COVID 19 showing that PMR is effective in improving the quality of sleep of COVID 19 patients [21].

The results from the review study above explain that progressive muscle relaxation training (PMR) is effective for reducing anxiety and improving sleep quality for COVID 19 patients. Progressive muscle relaxation techniques are easy to learn and are widely used today as a treatment option to reduce anxiety and improve sleep.

Scientifically reviewed studies have shown that providing interventions in the form of PMR is effective in improving sleep quality and reducing anxiety levels in COVID-19 patients. The results of this study are certainly very useful in the field of medical science, especially in the field of nursing because it can help health workers provide non-famakological interventions for COVID-19 patients. PMR is one of the effective strategies in improving sleep quality and reducing anxiety in patients. Further studies are needed to implement other non- farmacological interventions that can help lower anxiety and improve the patient's sleep quality.

The present study included limitations that should be considered when interpreting the results. In all included studies, side effects of the intervention were not mentioned; therefore, this point must be taken into account when using the results. Articles that meet the inclusion and exclusion criteria are limited.

CONCLUSION

Several studies have demonstrated the effectiveness of Progressive Muscle Relaxation (PMR) interventions in COVID-19 patients who experience anxiety and sleep disturbances. Progressive Muscle Relaxation (PMR) can improve the healing process. Medical personnel are expected to be able to implement the results of this study for COVID-19 patients in Indonesia. However, this research must be further developed to find effective non-pharmacologic therapies for COVID-19 patients, continued to find the best therapy to treat anxiety and sleep disorders in COVID-19 patients who are undergoing isolation treatment.

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CONFLICT OF INTEREST

No Conflicts of interest have been declared.

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