

Meditation and sleep quality: integrative review

Meditação e qualidade de sono: integrative literatura

Meditación y calidad del sueño: revisión integradora

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Abstract

To review the available scientific content regarding the relationship between meditation and sleep quality PubMed, Scopus and Web of Science databases were searched with the keywords “meditation”, “sleep” and “sleep disorder”. Articles were considered if published in English or Portuguese, between 2011 and 2022 attended to the following criteria: (1) reported data from an original study, (2) presented objective documentation of meditation’s outcomes, and (3) performed in adults. Articles that did not meet the inclusion criteria and presented pharmaceutical intervention were excluded. Overall, the studies in this review had a positive outcome on sleep quality after meditation. In some articles, a couple of diseases were presented with less severity on the ongoing condition after the practices. In addition, they helped with attention, perception, analytical ability, motor response and reaction time of people that performed it. Moreover, it brought effective results for the treatment of chronic insomnia, resulting in significant improvements in total sleep time, in the Pittsburgh Sleep Quality Index and improved sleep quality in individuals with chronic insomnia. Of the 14 studies included in this review, 9 were randomized controlled trials and 5 were population-based surveys. The outcomes of mindfulness meditation practice were diverse, ranging from improved sleep and life quality, reduction of sleep-related problems, positive interference with psychological problems, memory, and concentration. Despite positive results, there must be a methodological standard among the studies regarding this subject, with the aim to find reliable results that can be used for substantial clinical interventions.

Keywords: Meditation; Sleep; Sleep disorder.

Resumo

Para revisar o conteúdo científico disponível sobre meditação e qualidade do sono, as bases de dados PubMed, Scopus e Web of Science foram pesquisadas com as palavras-chave “meditation”, “sleep” e “sleep disorder”. Foram considerados artigos publicados em inglês ou português, entre 2011 e 2022, com os seguintes critérios: (1) relatasse dados de um estudo original, (2) apresentasse documentação objetiva dos resultados da meditação e (3) realizada em adultos. Excluímos os artigos que não atenderam aos critérios de inclusão e apresentavam intervenção farmacêutica. No geral, os estudos desta revisão apresentaram um resultado positivo na qualidade do sono após a meditação. Em alguns artigos, algumas doenças se apresentaram com menor gravidade após as práticas. Além disso, ajudaram na atenção, percepção, capacidade analítica, resposta motora e tempo de reação das pessoas que o realizaram. Ainda trouxe resultados efetivos para o tratamento da insônia crônica, resultando em melhoras significativas no tempo total de sono, no Índice de Qualidade do Sono de Pittsburgh e na qualidade do sono em indivíduos com insônia crônica. Dos 14 estudos incluídos, 9 eram ensaios clínicos randomizados e 5 eram pesquisas de base populacional. Os resultados da prática da meditação mindfulness foram diversos, variando de sono melhorado e qualidade de vida, redução de problemas relacionados ao sono, interferência positiva com problemas psicológicos, memória e concentração. Apesar dos resultados positivos, deve haver um padrão metodológico entre os estudos sobre o assunto, a fim de encontrar resultados confiáveis que possam ser utilizados para intervenções clínicas substanciais.

Palavras-chave: Meditação; Sono; Distúrbio do sono.

Resumen

Para revisar el contenido científico disponible sobre la meditación y la calidad del sueño, buscamos datos en PubMed, Scopus, Web of Science con las palabras clave "meditación", "sueño" y "trastorno del sueño". Consideramos artículos publicado en inglés o portugués, entre 2011 y 2022 atendieron a los siguientes criterios: (1) informaron datos de un estudio original, (2) presentaron documentación de los resultados de la meditación y (3) realizado en adultos. Se excluyeron se no cumplieron con los criterios de inclusión y presentaron intervención farmacéutica. En general, los estudios tuvieron un resultado positivo en la calidad del sueño después de la meditación. En algunos artículos, algunas enfermedades fueron presentadas con menor gravedad en la condición después de las prácticas. Además, incluso ayudaron con la atención, la respuesta motora y el tiempo de reacción. Trajo resultados efectivos para el tratamiento del insomnio crónico, resultó en mejoras significativas en el tiempo total de sueño, en índice de calidad del sueño de Pittsburgh y calidad del sueño en personas con insomnio crónico. De los 14 estudios incluídos, 9 eran ensayos controlados aleatorios y 5 eran encuestas poblacionales. Los resultados de la práctica de la meditación consciente fueron diversos, desde la mejora del sueño y la calidad de vida, la interferencia positiva con los problemas psicológicos, la memoria y la concentración. A pesar de los resultados positivos, debe haber un estándar entre los estudios, con el objetivo de encontrar resultados confiables que puedan ser utilizados para intervenciones clínicas sustanciales.

Palabras clave: Meditación; Sueño; Desorden del sueño.

1. Introduction

Sleep is a physiological state responsible for restoring the body to both physical and mental rest through mechanisms that involve behavioral quiescence and active regulation of biological systems, allowing the body to regulate better the homeostatic pressure and circadian rhythms (Departamento de Ciência e Tecnologia do Ministério da Saúde, 2011).

About two-thirds of people in the world do not get adequate sleep, being chronic sleep disorders a pandemic, especially in this century. Progressive sleep deficiency can increase the risk of mood and anxiety disorders, cognitive impairments, and a variety of medical conditions, including cardiovascular disease and obesity (Ong & Moore, 2020). Notably, sleep disorders have adverse consequences in people's lives by decreasing their daily function, increasing the propensity for psychiatric disorders, cognitive deficits, emergence and worsening of health problems, risk of traffic accidents, absenteeism at work, and for compromising life quality (Menezes & Dell'Aglio, 2009). Currently, there are several treatments indicated to improve those conditions, such as the use of medications, cognitive-behavioral therapy, and the practice of meditation.

Overall, meditation can be defined as the practice of self-regulation on the body and the mind, characterized by a set of techniques that train focus and is associated with a greater mental, emotional, and physical well-being. The technique has been increasingly associated with the reduction of stress and anxiety levels, the control of chronic diseases, in addition to being an interesting therapeutic strategy for the treatment of numerous sleep disorders (Ong & Moore, 2020).

There are two types of meditation: concentration and mindfulness. Concentrative meditation is based on training

attention on a single focus, such as the breath. Mindfulness meditation, however, is characterized by awareness and experiencing the present moment with an attitude of acceptance, in which no type of elaboration or judgment is used (Marchiori, 2012). In recent years, this modality has gained interest as an alternative treatment for sleep disorders by reducing repetitive negative thoughts, decreasing emotional reactivity, and promoting an impartial reassessment of salient experiences, being a less invasive way to treat the conditions rather than by using pharmacological treatments (Ong & Moore, 2020).

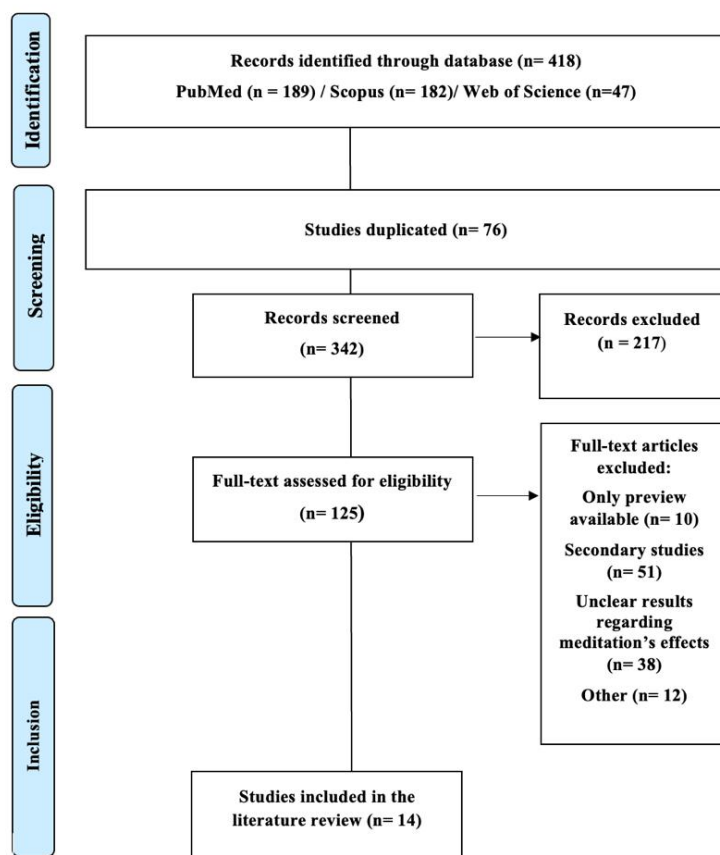
This literature review aims to summarize the available scientific content on meditation and its impact on sleep quality, as well as its contribution to the treatment and prevention of various sleep disorders.

2. Methodology

The PubMed, Scopus and Web of Science databases were searched for articles published between January 2011 and October 2022 using the following keywords: “meditation”, “sleep” and “sleep disorder”. The search string was made by combining the keywords with the Boolean operator “AND”.

The methodology used in this review summarizes most published online literature to provide a more comprehensive understanding of a particular subject (Whittemore & Knafl, 2005). We coded the articles found in PubMed (n=189), Scopus (n=182) and Web of Sciences (n=47) databases in the sequence listed in the search results from those databases. The articles were recorded and classified according to several categories shown in Figure 1. There were 76 duplicated studies that got removed from this review prior to the screening process. 342 articles were screened and only 125 out of those were considered for eligibility, leaving 217 records that did not attend to the review’s goals behind.

Figure 1 - Flow diagram of the literature review search results.



Source: Based on PRISMA statement www.prisma-statement.org.

Studies of many kinds that were accessible online were included in this review if they met the following criteria: (1) published in English or Portuguese, (2) reported data from original studies and not secondary ones, i.e., case reports or review articles (3) reported a clear correlation between meditation and sleep quality, such as decreasing sleep disturbances, stress, depression, and fatigue, (4) were performed in adults. Qualitative and quantitative studies were included, once that hearing from the patient's perspective about their experiences after meditation could possibly give us a better understanding of the results besides the questionnaires' analysis. In addition, articles were excluded if they did not follow the inclusion criteria already listed and if they presented any pharmaceutical intervention. Of those, 10 articles were excluded for only presenting a preview of the whole paper, 51 were not considered for being secondary studies, 38 did not present clear results regarding meditation's effects and other 12 were also not considered due to other reasons (such as lack of data and poor methodology). In total 14 articles were included in this review.

The data extraction categories were based on the content of each analyzed study included in this review (Pereira et al, 2018). Before the categorization, all the search studies from the databases used were manually coded, leading to consistent results on meditation and sleep quality included in this review.

Thematic coding was used to identify and record the topics found in each included article. The main findings were identified and grouped based on the results of the studies, along with the sample of the population studied in each case. Outcomes were synthesized into two main categories (i.e., meditation and its influence on quality of life, meditation and its impact on insomnia or other sleep disorders). In this process, two authors identified the most relevant topics to create the categories, and then, four other authors sorted out and grouped the data according to the categories. The other authors reviewed the selection and confirmed the adequations.

3. Results and Discussion

Most of the analyzed articles portray scientific evidence containing a positive relationship between meditation and quality of life, as demonstrated in Table 1. In addition, people's conception that meditation is something positive and functional (called "acceptance") has been increasing, as presented in the articles by Marques et al., Lau et al. and Geethika, B. Priya, J. In the study carried out by Lau et al., for example, the effect of acceptance was tested in individuals with psychological disorders and poor sleep quality, resulting in a positive association noted by the decrease in psychological stress caused by patients' previous conditions after persistent meditation and acceptance practices.

Individuals with "full consciousness" (practiced in mindfulness) had a worse sleep quality, according to a study presented by Marques DR et al. In this context, the neurophysiological action of the meditation practice became evident, since mindfulness meditation practitioners reached a state of basal hypometabolism while keeping the mind alert. It is based on this idea, that is, on the ability to obtain some degree of control over autonomic psychobiological processes, that meditation can be considered an effective technique of mental self-regulation (Menezes & Dell'Aglio, 2009).

As for the prevalence of sleep problems, the population survey study by Voiß et al. reported that these conditions are associated with white, older, and female people. In another data survey (Ding, et al., 2020), it was possible to verify that high rates of neuroticism act as a mediator between meditation's effects and sleep quality, being inversely proportional to its benefit.

Table 1 - Summary table of articles- main findings about meditation's outcomes found in the review.

No.	Authors/Year	Study Types	Sample	Main findings
1	Gross <i>et al</i> , 2011	Randomized clinical controlled trial	30 adults with chronic primary insomnia based on DSM-IV-TR criteria were randomized (2:1) to either mindfulness or intervention pharmacotherapy.	Initial evidence for the effectiveness of mindfulness practices as a viable treatment for chronic insomnia was measured by: sleep diary, actigraphy, well-validated sleep scales, and data of clinical remission and recovery. No statistically significant differences were found between the mindfulness and pharmacotherapy groups during the study in terms of sleep time or life quality outcomes
2	Chatterjee <i>et al</i> , 2012	Randomized clinical controlled trial	Healthy male volunteers (n=10) randomly drawn from the Indian Army	None of the analyzed parameters showed any significant change after sleep deprivation following meditation practice
3	Willoughby <i>et al</i> , 2012	Randomized clinical controlled trial	33 patients using antidepressants with sleep problems	Compared to controls, MBCT participants improved on both PSG and subjective sleep measures. They showed a pattern of decreasing wake time and ↑↑ sleep efficiency. Sleep depth, measured by stage 1 and slow wave sleep, did not change as a result of training
4	Cvengros <i>et al</i> , (2013)	Clinical trial	30 participants (18 women) completed the screening process and received the study intervention. Of these, 27 completed the protocol for an attrition rate of 10%.	Pretreatment DBAS scores were significantly negatively correlated with the percentage of days of adherence to total time in bed (r = -0.45, p = 0.02) and the percentage of days of adherence to elevation time (r = -0.64, p = 0.00) indicating that ↑ DBAS scores were associated with lower adherence. Pre-treatment DBAS scores were not significantly correlated with the percentage of days with meditation (r = 0.14, p = 0.48).
5	Hubbling <i>et al</i> , 2014	Randomized controlled trial	Adults (n=18) who completed an 8-week mindfulness-based stress reduction program.	Participants said they were not sleeping more, but sleeping better, waking up more refreshed, feeling less distressed about insomnia and better able to cope. Motivation to sustain behavioral changes was reinforced by feeling physically and more emotionally stable, seeing others in the mindfulness group improve, etc.. Body scanning has been identified as an effective tool to allow for faster falling asleep.
6	Ong <i>et al</i> , 2014	Randomized controlled trial	54 adults with chronic insomnia	Participants who had a mindfulness meditation practice showed significant ↓↓ in minutes of total awake time, PSAS and ISI. Also there was a greater ↓↓ in ISI from mindfulness meditation therapy for insomnia compared to stress reduction and ↑↑ rates of treatment remission (50%) and response (78.6%).
7	Black <i>et al</i> , 2015	Randomized controlled trial	2 parallel groups conducted at an elderly medical research center. Adult sample: (mean age, 66.3 years old) with moderate sleep disturbances ([PSQI]> 5)	Participants in the MAP group showed improvement over the SHE group on the PSQI. The mean difference between the groups was 1.8 with an effect size of 0.89. The MAPs group showed significant improvement over the SHE group on secondary health outcomes of insomnia symptoms, depression symptoms, fatigue interference, and fatigue severity (P < 0.05 for all).
8	Geethika & Priya, 2016	Population study of data collection	100 healthy first-year students at Saveetha Dental College who received 3 sessions of meditation classes previously	5.12% of students believe that meditation improves their sleep. 44.74% of students think that meditation gives them a calmer mind; 34.21% think meditation ↑ concentration, 13.16% think they can sleep better after meditating, and 7.89% believe meditation improves memory. 76.92% of students chose to recommend meditation to their friends and family with sleep disorders. 97% occasionally meditate with only 5.13% of students following meditation as a daily routine.

9	Lau <i>et al.</i> , 2018	Populationa l study of data collection	364 healthy individuals	The + association between consciousness and psychological stress in general was reduced with ↑ levels of acceptance. The direct effects of consciousness on sleep quality depend on acceptance levels. Also, there was an association between consciousness and poor sleep quality in general when acceptance levels were ↓.
10	Voiß <i>et al.</i> , 2019	Populationa l study of data collection	A total of 32,617 households participated in the NHIS 2017 and 26,742 adults provided data	The prevalence of sleep problems was 49.3%, with ↑ prevalence associated with being older, females, non-Hispanic white, and having ↑ education. Among individuals with sleep problems, 29.8% used MBM and 17.5% didn't. Being under the age of 30, female, non-Hispanic white, living in the western United States, having a college education, and having been diagnosed with heart disease predisposed MBM use among individuals with sleep problems. Yoga (16.3%), spiritual meditation (13.6%), and mindfulness meditation (7.5%) were the most used MBM approaches.
11	Marques <i>et al.</i> , 2020	Populationa l study of data collection	74 subjects screened by ISI data from 483 initial participants	Two groups with the same levels of insomnia severity were studied. One of the subjects reported insomnia with significantly ↓ of mindfulness practice and another group also reported insomnia but with ↑ mindfulness features. However, those with ↓ mindfulness practice had ↓ levels of self-compassion, humanity and ↑ rates of anxiety and depression when compared to the ↑ mindfulness group
12	Jalal <i>et al.</i> , 2020	Randomize d clinical controlled trial	10 patients with narcolepsy and sleep paralysis	Notably, meditation and relaxation therapy ($n = 6$) were applied for 8 weeks and resulted in a dramatic ↓ in the number of days when sleep paralysis occurred (50% ↓) and ↓ in the total number of sleep paralysis episodes (54%) in the last month of the study.
13	Ding <i>et al.</i> , 2020	Populationa l study of data collection	A total of 1,528 participants were assessed using questionnaires, with 1,423 participants having usable data.	Results suggested a potential mechanism for how the mindfulness practices influences sleep quality, provides a therapeutic target to improve sleep quality and offers a basis for predicting different outcomes.
14	Huberty <i>et al.</i> , 2021	Randomize d clinical controlled trial	124 patients in the intervention group and 139 patients in the control group.	Results from the intent analyses suggest that using the <i>Calm</i> app for eight weeks significantly ↓ daytime ($p = 0.018$) fatigue, as well as daytime ($p = 0.003$) and cognitive ($p = 0.005$) and somatic arousal ($p < 0.005$) sleepiness. 0.001) before sleep, compared to the wait-listed control group. Within the intervention group, use of the <i>Calm</i> app was associated with improvements in sleep quality ($p < 0.001$).

↓↓= decrease; ↑↑ = increase; ↑= high; ↓= low; + = positive; - = negative. DSM-IV-TR= Diagnostic and Statistical Manual of Mental Disorders Text Revision Fourth Edition; PSAS= pre-sleep arousal scale; ISI= Insomnia Severity Index; MBM = mind-body medicine; NHIS = National Health Interview Survey; MAP = mindful awareness practices; PSQI = Pittsburgh Sleep Quality Index; SHE = sleep hygiene education; MBCT = Mindfulness-Based Cognitive Therapy; PSG = polysomnographic; DBAS= Dysfunctional Beliefs and Attitudes about Sleep. Source: Authors

In older adults, the mindfulness technique is still not very prevalent (Ong et al, 2014). In a study conducted by Black et al., the practice was introduced to this age group as a short-term solution to remedy moderate sleep disturbances. The effect reported in this article proved to be positive as it reduced poor daytime performance in patients, which in fact contributed to an improvement in quality of life. In the younger population of college students, another paper (Geethika & Priya, 2016) indicated a certain popularity of the meditation practices, corroborating with data from Voiß et al., which attested to the greater adherence of young people to the practice. Known for having worse and shorter nights of sleep, college students are most likely to adopt measures that help them prevent having such a bad quality in their sleep. Consequently, mediation would have a

direct impact on their quality of life since concentration and memory were highlighted as one of the products of continuous practice. In a more recent publication carried out with college students in Brazil (Schuh, et al., 2021), all reported data proved that mindfulness meditation provided increased levels of concentration and focus for studying, improved sleep quality, promoted self-knowledge and subjective well-being after the sample participated in 11 sessions of the practice. Additionally, they also reported lower intensity on their anxiety, stress, and depression.

Another positive evidence of mindfulness practice associated with improvement in quality of life of patients diagnosed with depression was seen by Britton WB et al. In this manuscript, patients reported interruptions in their sleep caused by antidepressants' effects and, after 8 weeks of mindfulness-based cognitive therapy, the same group was studied in order to observe the results after intervention. Polysomnographic profiles and other subjective sleep parameters were analyzed and, as a conclusion, improvements were observed in the sleep continuity of these individuals.

Jalal et al. also reported diagnosed illnesses that had a reduction in their severity and incidence after meditation practices. In this research, the practice was performed for 8 weeks and present for its outcome reduced sleep paralysis in patients with narcolepsy. Sleep paralysis is associated with psychopathologies such as depression and other psychopathologies that can increase the severity of symptoms in general and, until the day the study was performed, there were no clinical studies or any other concrete results about specific treatments for the condition (Franceschini, et al., 2020). Therefore, the finding in this 2020 pilot study shows great relevance by providing evidence on a non-pharmacological treatment that reduces the incidence of narcolepsy episodes. Also, as shown by Britton W. B. et al., this kind of treatment is also effective on lowering depression's outcomes, which contributes to better nights of sleep.

Another clinical trial indicated that total sleep deprivation for a long period of time impairs attention, perception, analytical ability, motor response and reaction time, parameters which, however, were ameliorated after daily meditation practices, as it provides resistance to these cognitive deficits with insignificant changes in study parameters for total sleep deprivation (Huberty, et al., 2021). In line with this finding, Wells et al. reported in their social experiment a cognitive improvement on adults with mild cognitive impairment after mindfulness meditation practices, in addition to presenting a certain improvement in acceptance and social engagement of these individuals.

Thus, an improvement in quality of life is observed through meditation practices associated with different groups of individuals. Although some results with specific groups have brought greater and most relevant results in terms of improvement than others, it is still necessary to disseminate the practice on a larger scale in order to reach all types of people, since the studies that confirm the effectiveness of meditation are only approaching a small amount of group ages.

Mindfulness meditation practice has brought effective results for insomnia treatment according to Ong et al. and Gross et al. However, according to these articles, larger and well-designed studies that use a standard evaluation methodology are needed in order to reach a milder conclusion about such association. Likewise, in one of the randomized controlled clinical trials included in our review carried out by Gross et al., adults with chronic primary insomnia were randomized and submitted to a mindfulness intervention or pharmacotherapy, resulting in significant improvements in the ISI, PSQI, total sleep time measured by diary, sleep onset latency and sleep efficiency.

In another clinical trial, practicing mindfulness for 8 weeks resulted in an improved sleep quality for participants with chronic insomnia and provided a better feeling for those after waking up. The individuals studied in this trial state that being motivated by a support group and perceiving sleep hygiene results in practice made them feel encouraged to adopt a healthy sleep posture, which reduced their anguish about insomnia (Jansen et al, 2007) This belief about sleep is also demonstrated by the high overall adherence of participants in another study regarding three specific recommendations on treatment for insomnia during the period of analysis (Lau, et al., 2018)

Lately, there has been an increase in the use of mobile devices, such as tablets and smartphones, in line with the

increase in apps that provide an effective communication platform with their users, in order to solve occurrent problems, provide useful content, perform personalized services, among others. In this context, a clinical trial conducted by Huberty et al. tested the efficiency of a mindfulness meditation app (Calm) in reducing fatigue, pre-sleep awakening and daytime sleepiness in adults with sleep disorders. Results from the intent analysis suggest that using the app for eight weeks significantly decreased daytime fatigue, cognitive sleepiness, and somatic arousal ($p < 0.001$) before sleep and during daytime.

As for narcolepsy and sleep paralysis, only a few clinical studies have been published about its treatment. For instance, non-pharmacological proposals that include cognitive-behavioral approaches were shown in a non-randomized clinical study, resulting in clinical improvement with self-hypnosis, meditation therapy and relaxation¹⁸. In this study, 10 patients with narcolepsy and sleep paralysis were included, and the outcomes of meditation and relaxation therapy were presented as a dramatic decrease in the number of sleep paralysis' episodes.

Furthermore, effective meditation practices reflect on more significant improvements in insomnia, depression, and other secondary health outcomes when compared to theoretical sleep hygiene education. A sleep hygiene education program includes lessons on a healthy night of sleep, an unhealthy one, sleep problems, stress reduction, self-monitoring of sleep behavior, relaxation methods, as well as weekly behavioral strategies for sleep hygiene. After the program has been taught, participants should practice those lessons daily in order to improve their sleep (Blac, et al., 2015). However, in this study brought by Black DS et al. the act of learning about sleep itself was proven to be less effective on betterment of sleep quality when compared to the control group that practiced meditation.

Therefore, we can briefly conclude that insomnia and other sleep disorders can be ameliorated with alternative methods, being meditation a good therapeutic choice amongst other kinds that have been presenting with effectivity.

4. Conclusion

Of the 14 studies used, 9 were randomized controlled trials and 5 were population-based surveys. Among the interventions for the controlled trials, mindfulness practice was the most used to compare the effects on various health and sleep problems. There was a difference in the methodology of the studies and variations in the sample of each one, which did not allow for a methodological standard between the studies used in this review.

The results of mindfulness practice were diverse among the articles, ranging from improved sleep and life quality, reduction of sleep-related problems, positive interference with psychological problems, memory, and concentration. Overall, the total amount of the articles pointed to positive results for meditation practices, especially the mindfulness kind.

Another aspect to be pointed out is the improvement in quality of life, sleep, and sleep disorders when meditation was added to the routine of patients that used drugs for psychological treatments. However, despite the positive results, there were only a few references on it and lack of data in the articles about those patients, which makes it impossible to obtain greater precision in the information about them.

Even with positive results, a methodological standard must be pursued among the studies on this topic regarding the sample and the interferences carried out in this research in order to find reliable results by ways of comparison. Common limitations found in this review were: self-selected bias, lack of control group and uncertainty over whether changes could be due to the intervention. These limitations bring gaps for health professionals when indicating an intervention, which points to the need for more research directed to this area for the future.

In addition, according to the articles, mindfulness practices, even when introduced through mobile device applications, have brought significant improvements in the routine of those people, such as decreased daytime sleep and increased somatic awakening. Even though this finding is positive amongst other ways of intervention, it also demonstrates how much the methodological field on this topic is still open and needs standardization, due to lack of more conclusive details.

In summary, this review addressed different kinds of meditation as interventions, resulting in various outcomes regarding the effectiveness. Moreover, the need to refine such interventions is reinforced according to the adherence of each patient prone to doing meditation practices according to their needs. However, from this review it is possible to observe that, as a whole, the practices do not bring any harm but only proven benefits to most patients studied in each article. Given the increase in sleep disturbances and difficulties in normal day-to-day activities due to lack of sleep, interventions such as the one studied in this review will increasingly play an essential role in people's lives.

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