



Review Article

Combating the psychological impact of COVID-19 pandemic through yoga: Recommendation from an overview

Medha Sanjay Kulkarni ^a, Pradnya Kakodkar ^{b, *}, Tanuja M. Nesari ^c, Arati P. Dubewar ^d^a Department of Swasthivritta, All India Institute of Ayurveda, New Delhi, India^b Dr D Y Patil Vidyapeeth, Pimpri, Pune, India^c All India Institute of Ayurveda, New Delhi, India^d Department of Rasashastra, Dr. D Y Patil Vidyapeeth, Pimpri, Pune, India

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ABSTRACT

Globally, the psychological health of the people is being affected due to the COVID-19 pandemic. Given the fact that numerous systematic reviews already exist on yoga and mental health, it becomes vital to undertake an overview on the same. The objective of the overview was to summarise the evidence from different systematic reviews of distinct yoga interventions used to improve mental health and recommend yoga practices for the same. The protocol was registered on PROSPERO (CRD42020185221). MEDLINE via Pubmed, Cochrane Database of Systematic Reviews and Google Scholar were searched for relevant literature. Search terms used were "Yoga practice, mental health and systematic review". Reviews from earliest possible date till May 2020, including those examining the effects of any single or combination of yoga interventions on mental health reported on children, youth and adults were selected. The Assessment of Multiple Systematic Reviews (AMSTAR) tool was used to evaluate the evidence of the included reviews. Out of the 90 reviews found, eight unique reviews were selected for the overview. Overall, 243 studies were analyzed, with an overlap of only 6 studies across the reviews. Out of 8 reviews, only 2 were of high quality and the rest were of moderate quality. Owing to heterogeneity of the included studies, only descriptive analysis was possible. The results of the review indicate moderate to positive effects of yoga on the mental health parameters. Practicing yoga (physical postures, *Bhramary Pranayam*, mindfulness meditation, *sahaj* yoga and laughter therapy) can be beneficial to improve psychological health of the people during the COVID-19 pandemic.

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1. Introduction

Within a few weeks, the novel coronavirus disease that emerged at the end of 2019 threatened the lives of millions of people throughout the world and was soon declared as a pandemic by WHO. Thereafter, words like "social distancing", "quarantine" and "isolation" became synonymous with the prevention of COVID-19 spread. As there has been no standard treatment for COVID-19 so far, it is important to prevent and stop its spread [1]. The practices of physical distancing and self-isolation are a crucial part of the plan to reduce the coronavirus spread and resulting number of deaths from the disease. In order to control the spread of coronavirus,

worldwide "lockdown" was ordered which disrupted the daily routine of millions of people [2].

The lockdown and social distancing has led to challenges like feeling of stress, anxiety, fear, loneliness at times, depression, irritability, insomnia, confusion, anger, frustration, and boredom [3]. Also, rising numbers of COVID-19 cases and deaths are possibly raising stress and anxiety among the people [4]. Futuristic thinking of how secondary effects of the pandemic can affect life such as recession, social unrest and possibility of unemployment is also possibly triggering unpredictable and widespread mental health challenges. A nation-wide survey among the general population of China during the COVID-19 epidemic revealed that, it triggered a wide variety of psychological problems [5].

Presently, the impact of COVID-19 is affecting the people at three levels: physical health, psychological health, and economical level worldwide. Physical health is incomplete without psychological

* Corresponding author.

E-mail: Pradnya.kakodkar@gmail.com

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well-being and economic disruptions can affect both these factors. Although human beings have the coping mechanism to adjust to the demands of the situation, at the same time, it is ineffective to adopt and adapt to the environment. If the demand of the situation exceeds the coping capability of an individual, then a psychophysical deviation arises among the individuals, known as stress. This stress further causes anxiety and depression among them.

Consideration of the mind is a distinction of Ayurveda and yoga [4]. Yoga is an ancient Indian science and its objective is to attain the equilibrium of mind and body by controlling person's emotions. In the current era, yoga is recognized as a form of alternative medicine that implements mind-body practices and has been interpreted as a process of uniting the body via mind and spirit to promote physical and mental wellness.

There is a growing body of clinical research studies and systematic reviews on the therapeutic effects of yoga [6]. When there are multiple systematic reviews on a particular topic, overviews are most frequently employed. Overview is a new approach of bringing together all the systematic reviews, summarising and enhancing accessibility of existing evidence such that it can be a useful tool to support decision-making and developing guidelines by the clinicians and policy-makers [7]. It is also termed as umbrella review; meta-review; (systematic) review of (systematic) reviews; synthesis of systematic reviews; and summary of systematic reviews.

Owing to the background of the disturbed psychological health of the people globally due to COVID-19 and given the fact that numerous systematic reviews already exist on yoga and mental health, it becomes vital to undertake an overview. The objective of the overview was to summarise the evidence from different systematic reviews of distinct yoga interventions used to improve mental health and recommend yoga practices to combat the psychological impact of COVID-19 pandemic.

2. Material and methods

2.1. Protocol and registration

This protocol is registered on the International Prospective Register of Systematic Reviews (PROSPERO) under CRD42020185221.

2.2. Inclusion criteria

Systematic review and/meta-analyses of randomised controlled trials (RCT) and other clinical studies that examine the effects of any single or combination of yoga interventions on mental health; Reviews reporting intervention on children, youth and adults; Reviews available from earliest time till present day; Reviews in English language and other language where translation to English was possible.

2.3. Exclusion criteria

Individual clinical studies and narrative reviews; Reviews explaining the yoga effects among population with mental diseases and other systemic diseases.

2.4. Search methods for identification of studies

MEDLINE via Pubmed, Cochrane Database of Systematic Reviews and Google Scholar were searched. No filters of date or language restrictions were placed on the search. The search terms used were "Yoga practice, mental health and systematic review".

2.4.1. Selection of studies

Two authors (MK, PK) independently screened titles and abstracts to identify relevant studies for full-text reviews. Inclusion of full-text was done by agreement. Any discrepancies in the inclusion of abstracts or full-text articles was resolved by discussion and reaching a consensus. If a consensus could not be reached a third author (AD) was consented.

2.4.2. Data extraction and management

Two reviewers (MK,PK) independently performed data extraction for each review. Discrepancies in the data extracted were resolved by discussion and reaching a consensus. The following information from all the included reviews was extracted: author names, year of publication, number of included studies, type of yoga interventions, and results.

2.4.3. Quality assessment

To ensure that the included reviews are having good methodological rigour, all the reviews were screened with the Assessment of Multiple Systematic Reviews tool (AMSTAR) [8].

3. Results

The initial search in Pubmed yielded 82 hits while the additional 8 titles were from other sources. Based on title screening, 12 articles were selected. Further on reading the full-text, only 8 reviews were selected for the final inclusion and 4 reviews were excluded [6,9–11]. No review was selected from the Cochrane library although, it had a special collection of systematic reviews on yoga [11]. However, each of the review was undertaken for the systemic conditions (cancer, musculo-skeletal diseases, cardiovascular disease, mental disorders, pulmonary condition, health of older people, neurological condition and child health) and it did not fit our inclusion criteria.

Data extracted [13–20] is presented in Table 1. Out of the 8 selected reviews, only two reviews included were pure RCT's [14,19], while others had combination of study designs [13,15–18] and one review included non-interventional studies [20]. Total studies reviewed in 8 systematic reviews were 243. Two reviews included studies on yoga interventions like physical postures, breathing exercises, meditation and relaxation [13,19]; one was on mindfulness and meditation [14]; one was on laughter therapy [15]; one was on modern postural yoga [16]; one was on *Sahaj* Yoga (SY) [17]; one was on *Bhramary Pranayama* (Bhr.P) [18] and lastly, one review was on yoga practices which the people practiced on their own [20]. All the reviews indicate moderate to positive effects of yoga on the mental status as measured using self-administered questionnaires on anxiety, depression, stress, quality of life, coping mechanism and positive effect. Fig. 1 shows the methodological quality of the reviews expressed as AMSTAR score which ranged from 5 to 10. Two reviews were high quality [14,15] while remaining were moderate [13,16–20].

4. Discussion

This overview has attempted to compile the information from different reviews and analyse the data descriptively. The results indicate that yoga has beneficial effects on mental health. Our results are in consensus with another overview that adds a comprehensive and methodical examination of yoga interventions in adult populations for treatment of acute and chronic health conditions and reports that yoga appears most effective for reducing symptoms in anxiety, depression, and pain [10].

Yoga is complex, comprising many different elements, including physical poses, breathwork, concentration, meditation, ethical

Table 1
Data extraction sheet.

Study authors	Objective of the review	Type and number of studies included	Yoga interventions studied	Results
James-Palmer A et al., 2020 [13]	To evaluate the implementation and effectiveness of yoga for the reduction of symptoms of anxiety and depression in youth.	RCT/Cohort/Case control studies/Analytical (n = 27)	Physical postures, breathing, meditation and relaxation	There were five RCTs assessing changes in levels of both anxiety and depression. Of these, two showed no significant differences between or within groups, while two studies showed reductions in symptoms of both anxiety and depression and one study only showed reductions in symptoms of anxiety. The studies reviewed were of weak to moderate methodological quality and generally showed reductions in symptoms of anxiety and marginal reductions in symptoms of depression. Practice of postures, generally lead to some reductions in anxiety and depression
Breedvelt JFF et al., 2019 [14]	To study the effectiveness of both yoga and mindfulness-based interventions on stress, depression, anxiety, and academic achievement for students in tertiary education.	RCT (n = 24)	Mindfulness, Meditation, Yoga	Moderate positive effects were seen with mindfulness, yoga or meditation-based interventions on symptoms of depression, anxiety and stress. Most studies were of lower quality and high risk of bias. There was no difference between yoga home practice and through treatment.
van der Wal CN, Kok RN 2019 [15]	To estimate the effect of laughter-inducing therapy on mental and physical health for a broad range of population and conditions	RCT/Quasi experimental studies (n = 86)	Laughter therapy with humor, without humor, and for some studies the kind of laughter was not known	Reasonably convincing trend indicating 'simulated' (non-humorous) laughter having a more positive effect on depression and anxiety compared to 'spontaneous' (humorous) laughter. Overall study quality was low with substantial risk of bias in all studies. It requires a trainer to perform the session and can be done in group or private setting.
Domingues RB.2018 [16]	To investigate the effects of modern postural yoga on positive mental health indicators in clinical and non-clinical populations	RCTs and pilot studies (n = 14)	Modern Postural Yoga (Asana-based)	Out of 14 studies, 10 showed significant positive effects on mental health outcomes. Many different styles of interventions were used which make comparison challenging. Given that yoga interventions pose serious methodological concerns, more research and better experimental designs are needed to properly assess the effects of yoga on Positive Mental Health indicators.
Hendriks T 2018 [17]	To summarise the effect of Sahaj Yoga (SY) on mental health	RCT/Non-randomized studies/ Cross-sectional studies/ Prospective cohort study (n = 11)	SY (short term and long term meditation).	SY may have beneficial effects on depressive symptoms, reduces stress and anxiety, increases positive affect (happiness, fearlessness, feeling inspired, integrity, feelings of bliss) and decreases negative effect (sadness, feeling upset, angry, nervous, emotional instability) among healthy adults. Long-term SY meditation practice may enhance the aforementioned cognitive-emotional functions and thereby may contribute to enhanced psychological well-being. Overall the studies on SY were of high quality.
Kuppusamy M et al., 2018 [18]	To explore and assess the benefits of the existing scientific studies on the Bhramary Pranayama (Bhr.P)	Experimental, study with or without control (n = 6)	Bhr.P	Bhr.P causes reduction in heart rate and BP, reduction in response to cold pressor test, improvement in cognition, reduction in irritability in tinnitus, favourable Electro cephalogram (EEG) changes and reduction in stress levels. None of the studies were RCT and reported high risk.
Tom Hendriks & Holger Cramer.2017 [19]	To assess whether yoga can improve positive mental health in healthy individuals.	RCT (n = 20)	Yoga postures, breathing practices and meditation	Yoga contributes to a significant increase in psychological well-being. There was no effect on the social relationship, life satisfaction and mindfulness. Due to the limited amount

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Table 1 (continued)

Study authors	Objective of the review	Type and number of studies included	Yoga interventions studied	Results
Park CL et al., 2015 [20]	Which demographic characteristics, psychosocial variables, and health-related characteristics are related to the practice of yoga and to the amount of yoga practiced?	Non-intervention studies (n = 55).	Yoga practices	of studies, the heterogeneity of the intervention and perhaps the way positive mental health is being measured, any definite conclusions on the effects of yoga on positive mental health cannot be drawn. There is a weak evidence supporting yoga and positive mental health. Yoga practitioners have higher health-related quality of life. Contradictory results are found in the area of physical and mental health. Data on mental health and subjective well-being in relation to yoga is complex. Yoga may be related to less stress and less maladaptive coping. Yoga use is greatest among women and those with higher socioeconomic status. There is limited evidence to explain the effects of yoga use in detail.

tenets, spirituality, inward attention, and self-knowledge [20]. This overview demonstrates the effectiveness of different yoga practices like *Asanas* (physical postures), breathing, meditation, *Bhramary Pranayam*, *Sahaj Yoga* and Laughter Yoga among youth and adults.

4.1. Summary of evidence

James Palmer A et al. [13] provide promising evidence supporting the use of physical postures, breathing exercises, meditation and relaxation to address internalizing symptoms of mental health in youth population. The review recommends that a yoga intervention should be implemented for at least 30 min, 2–3 times per week.

Breedvelt JJF et al. [14] report that moderate positive effects were seen with mindfulness, yoga or meditation-based interventions on symptoms of depression, anxiety and stress.

van der Wal CNand Kok RN [15] report that there was reasonably convincing trend indicating ‘simulated’ (non-humorous) laughter having a more positive effect on depression and anxiety compared to ‘spontaneous’ (humorous) laughter. Laughter-inducing therapies show promise as an addition to main therapies or medication.

Domingues RB [16] reported that 10 out of 14 studies using modern postural yoga showed significant positive effects on mental health outcomes. Most studies observe increasing trends in the promotion of positive mental health indicators due to yoga practices.

Hendriks T [17] recommended that SY may have beneficial effects on depressive symptoms, reduces stress and anxiety, increases positive effect (happiness, fearlessness, feeling inspired, integrity, feelings of bliss) and a decrease in negative effect (sadness, feeling upset, angry, nervous, emotional instability) among healthy adults. Long-term SY meditation practice may enhance the aforementioned cognitive-emotional functions and thereby may contribute to enhanced psychological well-being.

Kuppusamy M et al. [18] report that Bhr.P causes reduction in heart rate and blood pressure, reduction in response to cold pressor test, improvement in cognition, reduction in irritability in tinnitus, favorable EEG changes and reduction in stress levels. Unlike other parts of body, brain does not support any stretching exercises. Hence, vibration of head due to Bhr. P is a good alternative.

Tom Hendriks and Holger Cramer [19] reported that yoga postures, breathing practices and meditation contribute to a significant increase in psychological well-being. However, there has been no effect on the social relationship, life satisfaction and mindfulness.

Due to the limited amount of studies, the heterogeneity of the intervention and perhaps the way positive mental health is being measured any definite conclusions on the effects of yoga on positive mental health cannot be drawn.

Park CL et al. [20] reported that yoga practitioners have higher health-related quality of life. Contradictory results are found in the area of physical and mental health. Data on mental health and subjective well-being in relation to yoga is complex. Yoga may be related to less stress and less maladaptive coping.

4.2. How the yoga intervention works?

Asana or physical postures for different parts of the body promote strength, flexibility and endurance to body improving respiratory and cardiovascular function. It promotes recovery from several diseases and chronic pain as well as reduces stress, anxiety, depression, improves sleep patterns, and enhances overall well-being and quality of life [21–26].

Breathing practices or *Pranayama* are different breath control practices. Their regular practice results in individual experiencing relaxation. Slowing down of breath helps to focus the mind in present, slows down the cardiac rate, reduces blood pressure and cortisol levels. It also creates sense of well-being, improved self-confidence, efficiency, attentiveness, and positive outlook [27].

Meditation is a practice where an individual uses a technique – such as mindfulness, SY or *mantra* meditation to focus his/her mind on a particular object, thought, or activity. Consistent practice of meditation shows improvement in anxiety scores along with biochemical indices. It promotes a physiological state which is opposite to the flight-or-fight response responsible for stress with a sense of balance of the mind and body [28].

Laughter-inducing therapies show promise as an addition to main therapies or medication. It is getting popular since the last decade and is cost-effective. Laughter is presumed to decrease levels of stress hormones, and theorized to buffer the effects of stress on the immune system and thus elevate our mood [28]. However, it is best to do it in groups and with a trainer who can maintain the time and dose of laughter therapy [15].

4.3. Quality of systematic reviews included in the review

Out of the 243 studies included in the review, overlapping of the studies have been minimal (n = 6), indicating inclusion of wide

	James-Palmer A et al.[13]	Breedvelt JJF et al.[14]	van der Wal CN, Kok RN[15]	Domingues RB.[16]	Hendriks T [17]	Kuppusamy M et al[18]	Tom Hendriks & Holger Cramer[19]	Park CL et al [20]
Was an ‘a priori’ design provided?	●	●	●	●	●	●	●	●
Was there duplicate study selection and data extraction?	●	●	●	●	●	●	●	●
Was a comprehensive literature search performed?	●	●	●	●	●	●	●	●
Was the status of publication (i.e. grey literature) used as an inclusion criterion?	●	●	●	●	●	●	●	●
Was a list of studies (included and excluded) provided?	●	●	●	●	●	●	●	●
Were the characteristics of the included studies provided?	●	●	●	●	●	●	●	●
Was the scientific quality of the included studies assessed and documented?	●	●	●	●	●	●	●	●
Was the scientific quality of the included studies used appropriately in formulating conclusions?	●	●	●	●	●	●	●	●
Were the methods used to combine the findings of studies appropriate?	●	●	●	●	●	●	●	●
Was the likelihood of publication bias (a.k.a. “file drawer” effect) assessed?	●	●	●	●	●	●	●	●
Was the conflict of interest stated?	●	●	●	●	●	●	●	●
Total score	8	10	10	5	7	8	8	5

Yes=● No=●

Fig. 1. Methodological quality of the review (AMSTAR score).

range of unique studies. The studies are representing entire globe starting from USA, UK, India, Iran, Hong Kong, Taiwan, China, South Africa, Thailand, Korea, Sweden, Canada, Netherlands, Japan, Germany, Australia, Soviet Union, Switzerland, Slovenia, and Turkey. Two high quality reviews [14,15] have been undertaken with minimal methodological flaw and there has been no publication bias with equal distribution of the studies on either side of the funnel plot. The only lacuna here, was that, there was no mention of inclusion of grey literature and articles of Non-English language. Other six reviews [13,16–20] were moderate quality which had methodological errors like protocols of review not published, extraction of data was not done by at least two persons, non-inclusion of grey literature and non-English articles, not providing excluded study list, not assessing quality of studies and not assessing likelihood of publication bias. Overall, only three reviews performed meta-analysis [14,15,19]. The reviews which have not been able to do the meta-analysis and assess the publication bias, it

is probably because the included yoga intervention studies were of low quality [10], heterogeneous [6,19] and lesser in number [19].

4.4. Limitations of yoga studies

When considering results across reviews, it is important to note that the included studies on yoga varied greatly in terms of specific tradition and style, location, class level, teacher characteristics, and relative vigor and intensity of aerobic and musculoskeletal exercises [20]. The overview was a compilation of several different studies with multiple factors leading to heterogeneity viz., participant, type of study design, yoga practice, duration and technique, and outcome assessment tool. It was challenging to weigh the studies with a single lens. Common limitations indicated by majority of reviews reported was low quality yoga studies [13,14], weak evidence supporting the benefits of yoga practices [12,18], high-risk studies [14,17] and serious methodological errors [15].

Given this background of enormous heterogeneity, the authors cannot endorse or propose any single yoga type or yoga practice as effective modality for combating psychological effects.

4.5. Strength and lacunae of the overview

The strength of the overview is that, it has embarked on a systematic methodology. There are some limitations which cannot be overlooked. Firstly, the use of only three search terms and only three database search may not have resulted in including all yoga related reviews and secondly, Grading of Recommendations, Assessment, Development and Evaluations (GRADE) was not used for assessing the evidence of the reviews.

5. Conclusion

The robust data that is systematically compiled in this overview indicate that practicing yoga can be beneficial to improve psychological health of the people.

5.1. Implication for practice

This overview indicates that physical postures, breathing exercises, meditation, and laughter therapies have beneficial effects on mental health. Since nature of mental health problems in COVID-19 pandemic is quite complex, there cannot be a “Fit for all” model and it needs to be customized depending on the age, gender, physical constitution, and psychological symptoms. It can be recommended that an expert committee lays down guidelines and local yoga teachers design a syllabus according to these guidelines as per requirement of patient group at their disposal. Need of the hour is to attract attention of medical fraternity, administration, policy-makers and society at large towards yoga as a means of management of mental health problems, especially in the present pandemic. In India, the Ministry of AYUSH [29] in its guidelines to boost immunity during COVID-19 pandemic has already recommended practising yoga for 30 minutes.

5.2. Implication for research

Overview results indicate that the clinical studies undertaken to evaluate effectiveness of yoga are of low quality and hence to address this issue, a research committee should be instituted to propose standard checklist for conducting and reporting good quality yoga studies.

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Conflict of interest

None.

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