Chapter

Intervention of Yoga in Stress, Anxiety and Depression

Chandra Nanthakumar

Abstract

Yoga is not only an art but also an ancient science that evolved more than 5000 years ago. It is practised by people from all walks of life in almost every part of the world. In the past, the practice, which was seen to be spiritual and divine, used to be confined to smaller groups of individuals who were seeking moksha or liberation; however, the trend has transformed over the decades. Today, there are so many yoga studios worldwide, and this has made it easy for yoga enthusiasts. This chapter investigates the effectiveness of yoga not only as a complementary therapy but also as a viable option in the management of stress, anxiety and depression. Articles were retrieved using PubMed, MEDLINE and PsychInfo databases. The findings reveal that the practice of yoga as a complementary therapy and stand-alone therapy is effective in managing stress, anxiety and depression. However, further research is needed as all the studies reviewed were limited in terms of heterogeneity, sample size, intervention styles, frequency and duration of practice, and also teaching methods. The chapter concludes with suggestions for home practice.

Keywords: intervention of yoga, stress, anxiety, depression

1. Introduction

Amongst all the mental health disorders, anxiety, depression and stress appear to be the most common ones inflicting the human society. These diseases are disorders of the biochemical and neurophysiological systems which have an impact on not only the release of mood-regulating chemicals such as serotonin, dopamine and noradrenaline, but also on the cortisol and gamma amino-butyric acid (GABA) levels [1]. More than 264 million of people regardless of age, gender or creed suffer from depression [2]. Compared to men, women are more prone to this disorder, but the worrying trend is that depression leads to suicide. Evidence shows that approximately 700,000 people worldwide take their own lives annually, and what is more shocking is that suicide is deemed the fourth cause of death amongst 15 to 19-year-olds [3].

Not only depression, but also anxiety and stress are interrelated with physical well-being. For instance, cardiovascular diseases can lead to depression and vice versa. On a same note, the deadly Covid-19 pandemic which took the entire world by a storm in 2020 has had a significant undesirable impact on mental health. As the pandemic continues to ravage lives of innocent people in every nook and corner of the globe, a wide range of psychological outcomes have been observed at different layers of the society – individual, community, national and international levels. At the individual level, people are still apprehensive of falling ill or experiencing a painful death due the virus or being stigmatized by the society [4]. Health care workers

and families with infected patients are completely fatigued. School and college-going students are not only totally demotivated, but also displeased as they have had to switch to virtual learning which in turn has impacted not only their eyesight, but also their physical health due to prolonged hours of being glued to the computer screen, and their social life. Family bread winners in various sectors who have lost jobs, and those in dire need of financial aid are totally dejected and devastated. Findings also reveal that those who have been quarantined or isolated, experienced quite a significant amount of stress, anxiety, mood swings, depression, and insomnia [5–7]. Frequent exposure to media appears to be another detrimental contributing factor to stress and anxiety [8]. It appears that patients with depression more often than not show symptoms of anxiety disorders, while those with anxiety disorders exhibit signs of depression [9]. Nonetheless, it is evident that both disorders tend to co-exist [10]. There are still so many people out there who are anxious and stressed out that they or their loved ones may contract the disease and not survive.

As anxiety and depression are affiliated with morbidity and mortality, it is imperative that these illnesses be identified and treated. Common treatments for these mental health disorders are available. Besides psychosocial treatments, psychological treatments such as cognitive behavioral therapy and pharmacotherapy such as selective serotonin reuptake inhibitors (SSRIs) and tricyclic antidepressants (TCAs) are usually used as the first line of treatment in moderate to severely depressed individuals [11]. Antidepressants augmented with antipsychotics have shown positive results in treating anxiety. It is noteworthy that some of the drug-based treatments for anxiety have been reported to produce a sharp decline in depressive symptoms [12, 13]; however, the strategy involved in preventing depression by treating anxiety successfully warrants further clinical investigation. Benzodiazepine, a common drug-based medication that enhances the effects of GABA at its receptor, on the other hand, is only effective in treating anxiety and not depression [9].

While treatments are readily available, some of the victims do not seek help because of financial issues, fear of being stigmatized for visiting a mental health counsellor, ignorance or for no rationale at all. Furthermore, there could be concerns about the adverse outcomes and compliance of these drugs [14].

In many parts of the world today, complementary and alternative medicine treatments are gaining popularity by all and sundry. Mindfulness-based interventions such as meditation and yoga are widely used in the therapy of both psychological and also physical ailments as research has shown a link between these practices, and physical and psychological health changes [15]. Findings seem to reveal that the practice of yoga can positively affect the biochemical and neurophysiological systems by regulating the autonomic nervous system and stress response, hence lowering the stress, anxiety and depression levels [16]. There is evidence that patients favour these conventional methods of treatment compared to mainstream approaches such as psychotherapy or psychotropic medications [17].

This chapter will look at the philosophy and benefits of yoga, review some recent research that have been done on the intervention of yoga as an adjunct or stand-alone therapy for stress, anxiety and depression, the effectiveness of this mind-body regime and its implications for the sufferers of the current society.

2. Background

2.1 The philosophy of yoga

Yoga, an ancient mind-body movement practice, originated in India more than five millenniums ago. Also commonly referred to as a meditative movement

practice, it involves movement, a meditative state of mind, breath focus and deep relaxation for purposes of enhancing or healing the physical, mental and emotional well-being [18].

Yoga appears to be a form of alternative medicine [19], and its philosophy is based on the eight limbs schematised by Maharishi Patanjali, one of the main pillars of classical yoga. These eight limbs comprise yama (universal moral ethics), niyama (internal attitudes for personal discipline), asana (yoga posture), pranayama (expansion of life force), prathyahara (withdrawal of senses), dharana (contemplation of one's true nature), dhyana (meditation) and samadhi (liberation) [20].

The first three limbs or stages – yama, niyama and asana, are considered the outward quests (bahiranga sadhana). With the practice of yama and niyama, the practitioner works towards keeping his passions and emotions under control, while the asana component, if practised diligently, keeps the body strong and healthy, and in harmony with nature. Breath regulation and mind control take place in the next two stages, that is, pranayama and prathyahara. Since these stages work at the inner level, they are known as inner quests or antaranga sadhana in Sanskrit. The last three stages – dharana, dhyana and samadhi, elevate the practitioner into the deeper recesses of the soul [21].

As yoga is not a religion or a cult, anyone regardless of age, creed or gender can learn and practise it. For the genuine seeker, whose desire is to experience the universal self within, the practice of yoga is an unbroken journey. Nevertheless, this ancient practice can be simplified and performed in a number of ways to suit the practitioner [22].

The practice of yoga is so flexible that the practitioner can simply utilize some, if not all, of the limbs to their own comfort. In a conventional 1 h yoga session, it is not uncommon to have the asanas integrated with practices of pranayama, prathyahara, dharana and dhyana. Having said that, there are many styles of yoga; precision and alignment, asthanga yoga, flow yoga, asana yoga, gentle yoga and hot yoga are some of the common styles [23].

2.2 Benefits of yoga

The practice of yoga brings about tremendous benefits to the body and mind. In the past nine decades, empirical research has been carried out on the techniques of yoga to test its credibility. Pioneer experiments conducted by Swami Kuvalayananda in 1924 focused on parameters like heart rate, blood pressure fluctuations, and intra-esophageal air pressure during the performance and also after the practice of asanas and pranayama [24].

Due to promising results, yoga has since been classified by the National Institute of Health as a form of complementary and alternative medicine, and people from all walks of life have incorporated this scientific practice into their lifestyles [25].

Unlike other forms of exercise, yoga focuses on being present in the moment. Hence, the practitioner needs to be mindful regardless of whether they have assumed a static position while holding an asana for a couple of breaths, or in motion especially during the performance of an asana. Preliminary research has advocated that yoga may increase levels of mindfulness in the practitioner [26, 27]. The asanas when performed steadily and joyfully, are useful in preventing and correcting structural imbalances in the body [28].

As this ancient science also appears to be a form of moving meditation, there have been suggestions that practitioners are more likely to be engaged in the movement aspect of yoga as it stimulates the cognitive processes related to mindfulness [29]. In addition, the meditative movement, which coordinates each movement with the breath systematically, increases physical endurance in the practitioner

over time. As the muscles recurrently contract with more force while performing a particular movement, their strength eventually increases. An example would be in the classical cobra pose (bhujangasana). In this pose, the practitioner starts of by lying flat facing downward on the mat. As the upper torso and head are lifted of the mat upon inhalation, the back extensors are engaged and contracted strongly. Hence, if the position is held long enough (while breathing normally), and if the movement is repeated a couple of times in each practice, the back muscles will be strengthened [30].

Muscles and connective tissues are stretched in asanas to increase flexibility. Regardless of whether the stretch is with or against gravity, the body will experience a stretch, thus increasing flexibility [30]. Unfortunately, in the current situation today where many, who work from home, pay little attention to their sitting position, the structural alignment is greatly compromised. Certain sporting activities like tennis and football, which require strenuous use of one side of the body, are equally to be blamed too. Asanas taught in yoga have been known to prevent and correct structural misalignments in the body.

Having said that, existing research unveils that the benefits of yoga are not limited to only correcting structural misalignments, enhancing stretching and improving flexibility; yoga also enhances emotional and psychosocial health and brings about an increase in proprioceptive and interoceptive awareness [31, 32]. There have been propositions that if yoga is practised consistently, it has the ability to induce neuroplasticity i.e., changes in the neural pathways of the brain, thus improving psychological skills [33]. This augurs well for the yoga practitioner as it suggests that the brain can be rewired just like a muscle in the physical body.

3. Intervention of yoga in stress, anxiety and depression

Yoga as therapy or therapeutic yoga has been defined as application of yoga postures and practice to the treatment of health conditions [34]. Evidence from a growing body of research supports the notion that yoga may bring about positive effects not only in one's physical but also mental health through the downregulation of the hypothalamo–pituitary adrenal (HPA) axis and the sympathetic nervous system (SNS) [35].

3.1 Methodology of yoga intervention

Since the aim of this review is to look into the impact of yoga specifically on stress, anxiety and depression in this contemporary society, only findings from articles that were published from 2014 to 2021 were reviewed and included. A combination of databases including PubMed, MEDLINE and PsychInfo were used to identify these articles with the help of keywords and phrases such as "intervention of yoga," "anxiety," "stress," and "depression." The search was streamlined to include only studies that were conducted with adults as participants, irrespective of gender or creed. Those that were conducted with children or teenagers below the age of 18 were excluded completely. In addition, studies that included adults suffering from multiple diseases and/or mental health issues, such as psychosis, obsessive – compulsive disorder and health-related aspects of physical fitness were not included in the discussion here. Studies that included pregnant and post-partum participants were also omitted as it is not unusual for this category of participants to undergo depression and anxiety during that period. In terms of the intervention, only studies that integrated classical yoga were included. Hence, the discussion is substantiated with findings from nine studies conducted between 2014 and 2021.

Authors	Description of Intervention	Findings
Kinser et al. [40]	RCT; YG: 75 min of hatha yoga (asanas, breathing techniques, relaxation, guided meditation) per week over 8 weeks; CG: health education activities (lectures, videos, discussions) Both groups continued with prescribed medication and maintained their lifestyle activities.	YG experienced multiple benefits of yoga including a boost of confidence; Gained new skills to be used in daily life to manage depression and stress;
Doria et al. [39]	Pre-test post-test; Grp 1: medication+SKY+self-help group weekly; Grp 2: SKY+self-help group weekly but no medication 6 months prior to study Intervention: 10 sessions of 2 h SKY in 2 weeks followed by weekly SKY for 6 months (asanas, pranayama, chanting, prathyhara, dharana)	A reduction in anxiety and depression levels in both groups No significant differences in scores between both groups
Falsafi and Leopard [37]	Quasi-experimental (repeated measures with one group); Intervention: 90 min yoga per week for 8 weeks (asanas, pranayama and mindfulness practice)	Significant decrease ($p < 0.05$) in depressive symptoms
De Manincor et al. [41]	RCT; YG: A 6 week yoga program; 30 min of vini yoga practice (asanas, pranayama, relaxation, mindfulness, meditation) for 4.8 days per week + TAU; CG: TAU – yoga was given after waitlist period.	A significant reduction in depression and anxiety scores; YG showed greater reduction compared to CG.
Falsafi [36]	RCT (stratified- randomised controlled repeated measures); YG: 8 weeks hatha yoga; 75 min session once a week; 20 min daily home practice. CG: absence of yoga MIG: mindfulness practice	YG and MIG showed significant reduction in depression, stress and anxiety compared to CG; no significant change in CG; No difference between YG and MIG, but self-compassion scores significant in MIG.
Prathikanti et al. [42]	RCT (stratified-randomised controlled); YG: A 8 week yoga program (asana, pranayama, dharana, prathyahara); 90 min per session, two sessions a week; props used; TAU. CG: 90 min of Yoga history workshop twice a week for 8 weeks, TAU. No medication for both groups.	YG showed a significant decrease in depression compared to CG ($p = 0.034$). YG more likely to achieve remission. YG requested for more sessions per week and also permission to attend yoga history workshop.
Uebelacker et al. [44]	RCT (stratified-randomised controlled); YG: A 10 week yoga program (asana, pranayama, dharana, dhyana, prathyahara); 80 min per session; one or two sessions per week; TAU. CG: A 10 week healthy-living workshop; 60 min per session; one or two sessions per week; TAU.	Insignificant difference between YG and CG; YG demonstrated lower levels of depressive symptoms, better social and role functioning, and general health perceptions when compared to CG.
Shohani et al. [43]	Quasi-experimental (pre/post -test); YG: 60–70 min hatha yoga, three times a week for 4 weeks	A significant, decrease in depression, stress and anxiety in the YG ($p < 0.001$).
Simon et al. [38]	RCT (three-arm controlled single blind); YG: A 12 week program (asana, pranayama, dharana, prathyahara dharana, dhyana) 120 min per session CBT: evidence-based GAD protocol CG: stress education	YG and CBT showed efficacy for treatment of GAD; CBT remains first-line treatment.

CG: control group; CBT: cognitive behavioral therapy; GAD: generalized anxiety disorder; MIG: mindfulness intervention group; RCT: randomized controlled trial; TAU: treatment as usual; and YG: yoga group.

Table 1.
Summary of the intervention and findings of the selected studies.

The design of all the studies varied considerably from pre-test/post-test to quasi-experimental and randomised controlled trials (RCTs). One of the RCTs was a stratified-randomised controlled with repeated measures [36]. The sample size incorporated in all these studies was relatively small, ranging from 18 [37] to a maximum of 226 [38]. While this review is not limited to qualitative and quantitative studies, the instruments used in each study varied rather significantly. In all these studies, the intervention of yoga was heterogeneous. Studies that had incorporated transcendental meditation or mindfulness meditation (or any other forms of meditation) or pranayama as stand-alone practices are not included in this discussion.

Only studies that assimilated aspects of classical hatha yoga specifically asana, pranayama, prathyahara, dharana and dhyana were included, though the duration of each class and frequency of sessions varied considerably. One study had administered Kundalini yoga; however, it had incorporated all the aspects of classical hatha yoga, hence the findings of that study were included in this review [38]. It is interesting to note that another study had incorporated chanting as part of the intervention [39].

3.2 Outcomes

On a positive note, most of the studies reviewed (2014–2021), if not all, exhibited appreciable outcomes; intervention of yoga, with or without pharmacotherapy, appeared to be effectual in reducing the symptoms of these mental health disorders [36–44]. A summary of the intervention and findings is provided in **Table 1**. Even though the duration of each and every study reviewed in this chapter varied considerably, that is, from 4 weeks to 6 months, there are implications that the practice of yoga advocates changes in the neural pathways of the human brain, resulting in favorable effects to the brain activity. Evidence has shown that, when compared to controls, there is less activation in the dorsolateral prefrontal cortex of yoga practitioners [45]. It appears that if there is consistency in the practice of yoga, the alpha, beta and theta brainwaves are activated; these have been linked to improvement in not only memory, but also mood and anxiety.

4. Discussion

All the studies reviewed in this chapter incorporated the fundamental limbs of Patanjali yoga, that is, asanas, pranayama, prathyahara, dharana and dhyana. The first two limbs in yoga, that is, yama and niyama, are therapeutic in nature as both entail code of ethics that work at not only intrapersonal (yama), but also interpersonal (niyama) levels [46]. Yama includes practices such as ahimsa (non-violence), satya (non-stealing), asteya (non-lying), brahmacharya (non-excessiveness) and aparigraha (non-greediness). Niyama, on the other hand, encompasses traits such as saucha (cleanliness), santosha (contentment), tapas (sacrifice), swadyaya (self-study) and Ishwara pranidana (surrendering to the higher power). It is imperative to note that while none of these studies reported the inclusion of yamas and niyamas as part of the intervention, it is believed that these two limbs may have been interleaved into the yoga sessions in an informal manner [47].

It is common to prompt students in a timely manner specifically during the asana session to practise ahimsa, for example. While mindfully challenging oneself to perform a strenuous or a dynamic pose is encouraged, using unwarranted force recklessly to get into the pose is not. For obvious reasons, just like in any sporting activities, adding excessive pressure at certain joints in the body can and will bring

about unforeseen injury to the practitioner. More importantly, while the pose is being held (being in the pose), students are persistently reminded to bring their awareness to the deep joy and pleasurable feelings that they are experiencing at that moment regardless of whether they are in the full pose or in a modified version. This act of experiencing joy while being in a particular position brings us to one of the niyamas, that is santosha. Hence, in this manner, the other yamas and niyamas are introduced and expounded during a yoga session at the academy where classes are conducted.

In the studies that have been reviewed in this chapter, the instructors assigned to the yoga sessions may have implicitly incorporated the yamas and niyamas but may have inadvertently failed to report the minutiae and hence, the details of the latter were not highlighted in the papers published. Just like in any study, implicit details are imperative for informed choices to be made. If the specifics of the yoga intervention for each study had been reported, it would have been instrumental not only to the researcher and the reader, but also to the participant who may be keen on exploring the philosophical roots of the yogic practice [47].

It is noteworthy that despite the insignificant sample size, heterogeneity in the sample population, varied duration of the intervention and wide-ranging styles of yoga taught, all studies reviewed demonstrated positive results in reducing the scores in depression, anxiety, and also stress.

In one study, where both the yoga group (YG) and the control group (CG) underwent pharmacotherapy during the intervention, the YG not only experienced a significant decrease in ruminations, but also found solace in the practice; participants used yoga as a strategy to help cope with ill-thoughts and other symptoms of depression in daily life [40]. This could be due to the impact of one of the components in the yoga practice, i.e., yoga nidra (guided meditation) that may have enhanced the self-regulatory capacities in the participants. On the hindsight, participants of this study acknowledged that the practice of yoga had intensified their confidence and that the practice had become an internal motivator for continued participation.

Similar results were seen in another study that engaged sudharshan kriya yoga (SKY) [39]. There was hardly any difference in the scores between the two groups (one group did SKY with pharmacotherapy, while the other group did SKY sans pharmacotherapy), purely suggesting that SKY may be effective not only as a stand-alone therapy, but also as an adjunct therapy for patients undergoing medical treatment. This study was exceptional as it had incorporated chanting in the yoga session. Chanting appears to have a healing effect not only on the physical and emotional, but also on the mental and spiritual body. It provides the drifting mind with a focal point. Though the chanting aspect was brief in this study, previous research has revealed that chanting has the potential to bring about deactivation in the amygdala, parahippocampal and hippocampal brain regions [46]. By stimulating the auricular branches of the vagal nerves, chanting creates vibrations at the cellular level. It is these vibrations that create neuro-linguistic effects which induce tranquility in the body and mind. Those suffering from depression tend to have a noisy mind – one that is cluttered with heaps of unnecessary thoughts. It is believed that the sounds of the mantra have the ability to mask the negative voices in the brain. Only when these ruinous thoughts are eradicated, can the mind have room for positive contemplations.

Similarly, the eight-week yoga intervention study which was conducted on 18 patients diagnosed with anxiety in the US showed a significant reduction in depressive symptoms ($p < 0.05$) [37]. However, in the stratified RCT study that engaged college students in the USA, yoga and mindfulness practices were seen to be equally effective in reducing not only depression and anxiety, but also stress, even though

the self-compassion scores were more significant for the mindfulness practice group [36]. The intervention in the study also lasted 8 weeks.

In a study conducted amongst a subsyndromal population in Australia, a six-week yoga intervention was found to be effective in reducing depressive and anxiety symptoms in both groups of participants, the YG and the CG [41]. There was reduction in psychological stress and rumination, an increase in resilience, and an improvement in mental well-being. It is interesting to note that findings of this study revealed that the yoga participants, on their own accord, had reduced medication dosage and frequency of visiting the counsellor. Though the reasons for these actions are indistinct and warrants deeper investigation, the yoga intervention mode appeared effective in managing the issue at hand of these participants. Pharmacological interventions for depression and anxiety usually produce a delay of approximately 4 weeks before exerting significant mood effects over placebo; it may take up to 12 weeks to achieve full anti-depression effects with medication [48]. Hence, time is definitely a parameter for consideration in yoga intervention. However, in this Australian study, it was suggested that a 30 min yoga practice over 5 days per week should suffice for all and sundry.

Similar positive outcomes of practicing yoga were observed in a depressive and withdrawn community who participated in a randomized controlled trial in San Francisco [42]. Unlike other studies, participants in the YG in this study not only asked for more yoga sessions, but also sought permission to attend the theoretical sessions on yoga history that were specifically held for the CG. It appears that these participants were definitely eager to do yoga for the benefit of their own mind-body health, but at the same time, interested in understanding the physiology behind this ancient science. Specific asanas such as dhanurasana (bow pose), ardhakati chakrasana (half waist wheel pose), ardha chakrasana (half wheel pose), Bhujangasana (cobra pose), setu bandhasana (bridge pose), sarvangasana (shoulder stand) and matsyasana (fish pose) employed in this study were found to be effectual in helping the participants manage their depressive moods and anxiety. It is interesting to note that most of these asanas are heart/chest openers. It appears that in the process of expanding the chest and rib cage to oxygenate the lungs efficiently, these asanas have helped in managing symptoms of depression such as grief, anger and frustration.

The findings from an Iranian study which was carried amongst 52 women suffering from some form of mental health disorders albeit free from pharmacotherapy, was equally positive; the intervention of yoga as a stand-alone therapy brought upon a reduction in anxiety, depression and also stress levels ($p = 0.001$) in the participants who did 12 sessions of yoga over a four-week period [43].

While most studies showed promising outcomes, one study hardly showed any significant statistical difference between the YG and the CG even though there was evidence of a reduction in depressive symptoms and better social functioning in the YG [44]. These positive effects could have been merely an after effect due to the relaxation techniques included in the yogic regime. Relaxation techniques in yoga are known to downplay the sympathetic activity and balance the autonomic nervous system responses.

Finally, in one recent three-arm controlled single blind clinical trial, where participants were randomized over a period of 12 weeks to either the kundalini yoga (KY) or cognitive behavioral therapy (CBT) while the CG was subjected to stress education, it was found that the KY group and the CBT group had shown significant reduction in generalized anxiety disorder symptoms. That said, the findings also revealed that CBT appears to be more effective than yoga, and it was concluded that the former shall remain the first line of treatment for anxiety disorders [38].

However, in most, if not all, of the studies reviewed in this chapter, they were subjected to limitations. For example, a few of the studies were predominantly a female sample [40, 43]. While there is a greater tendency for women to suffer from depression compared to men [49], the sample size in these studies was disproportionately represented. Also, most of the studies were limited by the insignificant sample population and heterogeneity. Due to the absence of controls in certain studies, it was challenging to establish whether the results obtained were due intervention of yoga or another factor. RCTs are known to be intervention research of high standards, but most of the studies reviewed here were challenged due to several reasons. Either the randomization was inappropriate, yoga styles in terms of postures, breathing and meditative techniques were too varied and/or incongruence in teaching methods.

Despite the limitations, it appears that participants who have benefitted from these yoga sessions may now have an extra tool at hand to help them manage stress, anxiety and depression. Since there were no adverse effects reported in any of the studies, yoga appears to be a safe practice.

5. Conclusion

All studies that have been reviewed in this chapter incorporated the fundamental limbs of Patanjali yoga that is, asanas, pranayama, prathyahara, dharana and dhyana. Despite the limitations such as heterogeneity in the sample population, insignificant sample size, varied durations of intervention and styles of yoga taught, most studies, if not all, demonstrated substantial positive outcomes in reducing the scores in depression, anxiety and stress. Previous studies have shown that the practice of asana, pranayama, dharana and dhyana have the ability to still not only the mind, but also the body, thus lowering anxiety levels, and these effects were seen in the studies reviewed in this chapter.

Having said that, another factor to delve into is the time (duration) required for participants to master the yoga asanas, especially for those whose flexibility is compromised, and the breathing techniques. The duration for the psycho-physiological factors mediating specific mood benefits of yoga to develop and exert a quantifiable effect in the participant is equally important. While factors such as duration of a yoga session, frequency and duration of each limb in a yoga session warrant further investigation, selection of asanas in a yoga intervention should not be neglected.

At the Malaysian Yoga Academy, students, regardless of their mental or physical health conditions, are encouraged to practise yoga daily for at least 45 min. This is not only to ensure there is sufficient time to practise most, if not all the limbs, but also to sustain a healthy mind and body, and keep diseases at bay; this step is crucial as studies have indicated that many people suffer from some form of anxiety and/or mood disorder at some point in their life.

6. Suggestions for home practice

Here are some simple postures (asanas) and breathing practices one can do two to three times daily. All practices should be done on an empty stomach. A suggestion would be to practice before sunrise, and/or at sunset and/or before bedtime. If food has been consumed, allow 2 h for digestion before the practice. It is imperative to note that these practices do not replace any form of prescribed medication. They are merely suggested complementary practices towards better mental and physical health, and tools that can be used to manage a sudden onslaught of stress, anxiety and/or a depressive mood.

6.1 Postures

i. *Swaying palm tree pose*: Stand with the legs 2 feet apart. Upon inhalation, the hands are raised vertically upwards. Upon exhalation, the torso is stretched sideways to the right. This position is held for 2–3 s. Upon inhalation, the torso is brought to the center. Then upon exhalation, the torso is stretched sideways to the left. This right and left movement is considered one set. Depending on one's capacity, one may perform up to five sets of this asana.

ii. *Double angle pose*: Standing with the legs 2–3 feet apart, interlace the fingers at the back of the body. In this starting position, inhale slowly and deeply. Upon exhaling, stretch the torso forward. If the body allows a greater stretch, bring the torso a horizontal position while gently lifting the hands away from the body. While breathing normally, hold this position for approximately 5 s before inhaling to bring the torso up to a vertical position. Depending on one's capacity, one may repeat this stretch three times, increasing the 'holding duration' from 5 to 10 s in the second and third repetition.

iii. *Half wheel pose*: Stand with the legs hip width apart. Place palms at the back of the waist with all fingers pointing downward. This is the starting position. Upon inhalation, bend the torso backwards from the lumbar region. Then exhale and continue with normal breathing while holding this position for 10 s. Inhale and bring the torso up the original position. Depending on one's capacity, this posture may be repeated three to five times.

6.2 Breathing techniques

i. *Deep breathing with hand movement*: In a comfortable sitting position (on the floor or on the chair), stretch the hands out to the front parallel to floor. The palms are in contact with each other. This is the starting position. Upon inhalation, bring the hands away from each other and stretch it to the back without any exertion. Hold for 2 s. Upon exhalation, bring the palms together to the starting position. This is one set, and one may do up to 10 sets in a nice and slow manner with breath awareness.

ii. *Alternate nostril breathing*: Sit in a comfortable position (on the floor or on the chair). If one is seated on the floor cross-legged, they may lean against the wall for support. Place the left palm facing upward on the left knee and allow the tip of the index finger to be in contact with the tip of the thumb throughout the practice. The remaining three fingers are stretched out without strain. Close the right nostril with the right thumb. For convenience, the index and the middle finger may be folded towards the palm, while keeping the ring and little fingers stretched out. This is the starting position. Inhale deeply through the left nostril. Then close the left nostril with the ring and index fingers. Subsequently, release the right thumb and exhale completely through the right nostril. Next, inhale through the right nostril. At the end of the inhalation, close the right nostril with the thumb and open the left nostril to exhale. This complete cycle is one round of alternate nostril breathing. One may practice up to 10 rounds at one sitting, bearing in mind that the inhalation and the exhalation should not only be slow and steady, but also silent and controlled.

iii. *Humming bee's breath*: Sit in a comfortable position (on the floor or on the chair). Back of the palms are rested on the knees – right palm on the right knee and left palm on the left knee. This is the starting position. Inhale deeply through both the nostrils. Allow the breath to stop effortlessly. Then exhale slowly while producing a humming sound like a bee. This is one round. One may practise up to 10 rounds at one sitting and increase the number of repetitions gradually.

All these postures and breathing techniques induce relaxation for the body and mind. One may practice all the postures and breathing techniques given here at any one sitting; alternatively, one may practice a few.

Acknowledgements

The author is grateful to Malaysian Association of Yoga Instructors (MAYI) Yoga Academy and the Malaysian Yoga Society for all the trainings and certifications she has received over the years.

Conflict of interest

The author declares no conflict of interest.

Notes

As a yoga instructor and therapist, the author has shared lots of personal experiences and provided home practice for the benefit of those who need it. Thank you.

Author details

Chandra Nanthakumar
HELP University, Kuala Lumpur, Malaysia

*Address all correspondence to: nankumar60@yahoo.com; chandratk@help.edu.my

References

[1] Cramer H, Lauche R, Langhorst J, Dobos G. Yoga for depression: A systematic review and meta-analysis. Depression and Anxiety. 2013;**30**(11): 1068-1083. DOI: 10.1002/da.22166

[2] World Health Organisation. Depression [Internet]. 2020. Available from: https://www.who.int/news-room/fact-sheets/detail/depression [Accessed: June 10, 2021]

[3] World Health Organisation. Suicide [Internet]. 2021. Available from: https://www.who.int/news-room/fact-sheets/detail/suicide [Accessed: June 20, 2021]

[4] Salari N, Khazaie H, Hosseinian-Far A, Khaledi-Paveh B, Kazeminia M, Mohammadi M, et al. The prevalence of stress, anxiety and depression within front-line healthcare workers caring for COVID-19 patients: A systematic review and meta-regression. Human Resources for Health. 2020;**18**(100):1-14. DOI: 10.1186/s12960-020-00544-1

[5] Brooks SK, Webster RK, Smith LE, Woodland L, Wessely S, Greenberg N, et al. The psychological impact of quarantine and how to reduce it: Rapid review of the evidence. Lancet. 2020;**395**(10227):912-920. DOI: 10.1016/S0140-6736(20)30460-8

[6] Wang Y, Xu B, Zhao G, Cao R, He X, Fu S. Is quarantine related to immediate negative psychological consequences during the 2009 H1N1 epidemic? General Hospital Psychiatry. 2011;**33**(1):75-77. DOI: 10.1016/j.genhosppsych.2010.11.001

[7] Rubin GJ, Wessely S. The psychological effects of quarantining a city. BMJ. 2020;**368**:m313. DOI: 10.1136/bmj.m313

[8] Neria Y, Sullivan GM. Understanding the mental health effects of indirect exposure to mass trauma through the media. Journal of the American Medical Association. 2011;**306**(12):1374-1375. DOI: 10.1001/jama.2011.1358

[9] Tiller JWG. Depression and anxiety. The Medical Journal of Australia. 2013;**199**(6):S28-S31. DOI: 10.5694/mja12.10628

[10] Garber J, Weersing VR. Comorbidity of anxiety and depression in youth: Implications for treatment and prevention. Journal of Clinical Psychology. 2010;**17**(4):293-306. DOI: 10.1111/j.1468-2850.2010.01221.x

[11] Gautam S, Jain A, Gautam M, Vahia VN, Grover S. Clinical practice guidelines for the management of depression. Indian Journal of Psychiatry. 2017;**59**(1):S34-S50. DOI: 10.4103/0019-5545.196973

[12] Kendall PC, Safford S, Flannery-Schroeder E, Webb A. Child anxiety treatment: Outcomes in adolescence and impact on substance use and depression at 7.4-year follow-up. Journal of Consulting and Clinical Psychology. 2004;**72**(2):276-287. DOI: 10.1037/0022-006X.72.2.276

[13] Manassis K, Mendlowitz SL, Scapillato D, Avery D, Fiksenbaum L, Freire M, et al. Group and individual cognitive-behavioral therapy for childhood anxiety disorders: A randomized trial. Journal of the American Academy of Child and Adolescent Psychiatry. 2002;**41**(12): 1423-1430. DOI: 10.1097/00004583-200212000-00013

[14] de Manincor M, Bensoussan A, Smith C, Fahey P, Bourchier S. Establishing key components of yoga interventions for reducing depression and anxiety, and improving well-being: A Delphi method study. BMC Complementary and Alternative Medicine. 2015;**15**(1):1-10. DOI: 10.1186/s12906-015-0614-7

[15] Cuijpers P, Smit F, Bohlmeijer E, Hollon SD, Andersson G. Efficacy of cognitive-behavioural therapy and other psychological treatments for adult depression: Meta-analytic study of publication bias. The British Journal of Psychiatry. 2010;**196**(3):173-178. DOI: 10.1192/bjp.bp.109.066001

[16] Salmon P, Lush E, Jablonski M, Sephton SE. Yoga and mindfulness: Clinical aspects of an ancient mind/body practice. Cognitive and Behavioral Practice. 2009;**16**(1):59-72. DOI: 10.1016/j.cbpra.2008.07.002

[17] Kessler RC, Soukup J, Davis RB, Foster DF, Wilkey SA, Van Rompay MI, et al. The use of complementary and alternative therapies to treat anxiety and depression in the United States. The American Journal of Psychiatry. 2001;**158**(2):289-294. DOI: 10.1176/appi.ajp.158.2.289

[18] Ajaya S. Healing the Whole Person: Applications of Yoga Psychotherapy. Pennyslvania: Himalayan Institute Press; 2008. p. 3

[19] Bridges L, Sharma M. The efficacy of yoga as a form of treatment for depression. Journal of Evidence-Based Complementary & Alternative Medicine. 2017;**22**(4):1017-1028. DOI: 10.1177/2156587217715927

[20] Muktibodhananda S. Hatha Yoga Pradipika. 3rd ed. Munger: Yoga Publications Trust; 1998. p. 4

[21] Telles S, Singh N, Gupta RKB, A. A selective review of dharana and dhyana in healthy participants. Journal of Ayurveda and Integrative Medicine. 2016;**7**(4):255-260. DOI: 10.1016/j.jaim.2016.09.004

[22] Mohan AG, Mohan I. Yoga Therapy: A Guide to the Therapeutic Use of Yoga and Ayurveda for Health and Fitness. Boston: Shambhala Publications Inc; 2004. pp. 15-30

[23] Nichols N. How Does Yoga Work? [Internet]. 2021. Available from: medicalnewstoday.com/articles/286745 [Accessed: July 20, 2021]

[24] Alter JS. Yoga in Modern India: The Body between Science and Philosophy. Princeton: Princeton University Press; 2004. p. 73

[25] Williams KA, Petronis J, Smith D, Goodrich D, Wu J, Ravi N, et al. Effect of Iyengar yoga therapy for chronic low back pain. Pain. 2005;**115**(1-2):107-117. DOI: 10.1016/j.pain.2005.02.016

[26] Brisbon NM, Lowery GA. Mindfulness and levels of stress: A comparison of beginner and advanced hatha yoga practitioners. Journal of Religion and Health. 2011;**50**(4):931-941. DOI: 10.1007/s10943-009-9305-3

[27] Conboy LA, Wilson A, Braun T. Moving beyond health to flourishing: The effects of yoga teacher training. Scientific World Journal. 2010;**10**:788-795. DOI: 10.1100/tsw.2010.87

[28] Stiles M. Structural Yoga Therapy: Adapting to the Individual. San Francisco: Red Wheel/Weiser; 2013. pp. 17-20

[29] Butterfield N, Schultz T, Rasmussen P, Proeve M. Yoga and mindfulness for anxiety and depression and the role of mental health professionals: A literature review. The Journal of Mental Health Training, Education and Practice. 2017;**12**(1):44-54. DOI: 10.1108/JMHTEP-01-2016-0002

[30] Polsgrove MJ, Eggleston BM, Lockyer RJ. Impact of 10-weeks of yoga practice on flexibility and balance of college athletes. International Journal of Yoga. 2016;**9**(1):27-34. DOI: 10.4103/0973-6131.171710

[31] Nanthakumar C. The benefits of yoga in children. Journal of Integrative

Medicine. 2018;**16**(1):14-19. DOI: 10.1016/j.joim.2017.12.008

[32] Woodyard C. Exploring the therapeutic effects of yoga and its ability to increase quality of life. International Journal of Yoga. 2011;**4**(2):49-54. DOI: 10.4103/0973-6131.85485

[33] Brown RP, Gerbarg PL. Sudarshan Kriya yogic breathing in the treatment of stress, anxiety, and depression: Part I—Neurophysiologic model. Journal of Alternative and Complementary Medicine. 2005;**11**(1):189-201. DOI: 10.1089/acm.2005.11.189

[34] Collins C. Yoga: Intuition, preventive medicine, and treatment. Journal of Obstetric, Gynecologic, and Neonatal Nursing. 1998;**27**(5):563-568. DOI: 10.1111/j.1552-6909.1998.tb02623.x

[35] Sengupta P. Health impacts of yoga and pranayama: A state-of-the-art review. International Journal of Preventive Medicine. 2012;**3**(7):444-458

[36] Falsafi N. A randomized controlled trial of mindfulness versus yoga: Effects on depression and/or anxiety in college students. Journal of the American Psychiatric Nurses Association. 2016;**22**(6):483-497. DOI: 10.1177/1078390316663307

[37] Falsafi N, Leopard L. Pilot study: Use of mindfulness, self-compassion, and yoga practices with low-income and/or uninsured patients with depression and/or anxiety. Journal of Holistic Nursing. 2015;**33**(4):289-297. DOI: 10.1177/0898010115569351

[38] Simon NM, Hofmann SG, Rosenfield D, Hoeppner SS, Hoge EA, Bui E, et al. Efficacy of yoga vs cognitive behavioral therapy vs stress education for the treatment of generalized anxiety disorder: A randomized clinical trial. JAMA Psychiatry. 2021;**78**(1):13-20. DOI: 10.1001/jamapsychiatry.2020.2496

[39] Doria S, de Vuono A, Sanlorenzo R, Irtelli F, Mencacci C. Anti-anxiety efficacy of sudarshan kriya yoga in general anxiety disorder: A multicomponent, yoga based, breath intervention program for patients suffering from generalized anxiety disorder with or without comorbidities. Journal of Affective Disorders. 2015;**184**:310-317. DOI: 10.1016/j.jad.2015.06.011

[40] Kinser PA, Elswick RK, Kornstein S. Potential long-term effects of a mind-body intervention for women with major depressive disorder: Sustained mental health improvements with a pilot yoga intervention. Archives of Psychiatric Nursing. 2014;**28**(6):377-383. DOI: 10.1016/j.apnu.2014.08.014

[41] de Manincor M, Bensoussan A, Smith CA, Barr K, Schweickle M, Donoghoe LL, et al. Individualized yoga for reducing depression and anxiety, and improving well-being: A randomized controlled trial. Depression and Anxiety. 2016;**33**(9):816-828. DOI: 10.1002/da.22502

[42] Prathikanti S, Rivera R, Cochran A, Tungol JG, Fayazmanesh N, Weinmann E. Treating depression with yoga: A prospective, randomized, controlled pilot trial. PLoS One. 2017;**12**(3):e0173869. DOI: 10.1371/journal.pone.0173869

[43] Shohani M, Badfar G, Nasirkandy MP, Kaikhavani S, Rahmati S, Modmeli Y, et al. The effect of yoga on stress, anxiety, and depression in women. International Journal of Preventive Medicine. 2018;**9**(1):21-23. DOI: 10.4103/ijpvm.IJPVM_242_16

[44] Uebelacker LA, Tremont G, Gillette LT, Epstein-Lubow G, Strong DR, Abrantes AM, et al. Adjunctive yoga v. health education for persistent major depression: A randomized controlled trial.

Psychological Medicine. 2017;**47**(12): 2130-2142. DOI: 10.1017/S0033291 717000575

[45] Desai R, Tailor A, Bhatt T. Effects of yoga on brain waves and structural activation: A review. Complementary Therapies in Clinical Practice. 2015;**21**(2):112-118. DOI: 10.1016/j. ctcp.2015.02.002

[46] Kalyani BG, Venkata subramanian G, Arasappa R, Rao NP, Kalmady SV, Behere RV, et al. Neurohemodynamic correlates of 'OM' chanting: A pilot functional magnetic resonance imaging study. International Journal of Yoga. 2011;**4**(1):3-6. DOI: 10.4103/0973-6131.78171

[47] Nyer M, O'Hair CM, Hopkins LB, Roberg R, Norton R, Streeter C. Yoga as a treatment for depression: Applications for mental health practitioners. Psychiatric Annals. 2019;**49**(1):11-15. DOI: 10.3928/00485713-20181203-01

[48] Uher R, Mors O, Rietschel M, Rajewska-Rager A, Petrovic A, Zobel A, et al. Early and delayed onset of response to antidepressants in individual trajectories of change during treatment of major depression: A secondary analysis of data from the genome-based therapeutic drugs for depression (GENDEP) study. The Journal of Clinical Psychiatry. 2011;**72**(11):1478-1484. DOI: 10.4088/ JCP.10m06419

[49] Kessler RC, Berglund P, Demler O, Jin R, Koretz D, Merikangas KR, et al. National comorbidity survey replication. The epidemiology of major depressive disorder: Results from the national comorbidity survey replication (NCS-R). Journal of the American Medical Association. 2003;**289**(23): 3095-3105. DOI: 10.1001/jama.289. 23.3095