



THE EFFECTS OF YOGA ON INSOMNIA PATIENTS AMONG URBAN POPULATION -CHENNAI- A QUASI-EXPERIMENTAL STUDY

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ABSTRACT

Background: Insomnia is a highly prevalent condition among the elderly as well as people above 40years of age. Insomnia can affect health (both mental and physical), day-to-day life activities, quality of daily life and in general, it affects overall wellbeing of life. Poor sleep quality could be because of physical and psychological stress, age-related physiological changes, chronic comorbidities, and lifestyle changes. Consumption of medications is the most commonly used treatment, but it can lead to dependency and have many adverse effects. Therefore, as an interventional method that is non-pharmacological and cost-effective, yoga has gained significant attention among insomnia patients. Yoga has been shown to reduce anxiety and physiologic arousal through a multidimensional practice consisting of specific postures, breathing exercises and a philosophical attitude[1]

Objective: To evaluate the effectiveness of a structured yoga intervention in improving sleep quality and reducing insomnia and related symptoms among elderly individuals in an urban population

Methodology: A Pre and Post interventional assessment conducted to a study group of 60 elderly people with sleep related complaints. A total of 3 months of intervention of yoga were given and sleep parameters were assessed using a set of standardised questions.

Results: This study validated a considerable improvement of sleep parameters after the intervention. The finding of the data indicates a persistent reduction in mean scores of the data and a p value <0.05 for a set of sleep variables. Thus, the study reflects a notable advancement in sleep quality and a decrease in insomnia-related symptoms after the intervention.

Conclusion: The study implies that yoga is an effective, possible and low-cost intervention for enhancing sleep quality among individuals above 40 years old. It considerably improves overall well-being by improving sleep disturbances. So it can be used as a maintainable approach in community health care initiatives for insomnia-related issues.

INTRODUCTION

Insomnia is a major health problem that mostly affects the elderly population due to age-related physiological, psychological and social changes. Public health-related studies show that more than 60% of the elderly population have at least one chronic sleep deficiency complaint.

Emotional regulation, metabolic homeostasis, immune system functioning, etc., are all dependent on the normal sleep pattern of the body. As we age, changes happen to the human body, like impaired melatonin rhythm, increased comorbidities, psychological and physiological stress, which results in polypharmacy and over the counter drugs usage, and it worsens the problem. [2].

Good sleep quality is essential for human functions. Individuals who need to make critical decisions require optimised cognitive functioning. There is evidence that improved sleep increases cognitive functioning and partial sleep deprivation reduces it [3]. As a result, both quality and quantity of sleep are affected, which can result in daytime fatigue, lesser productivity and functional capacity, memory impairment, irritability and non-restorative sleep



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habits. And all these lead to depression, anxiety, poor quality of life and increased healthcare utilisation if it is untreated. Female populations at some stages in their life span may be more vulnerable to insomnia. For them, hormonal changes play an important role in influencing women's sleep construction [4]

People with insomnia mostly use sleep-inducing hypnotic drugs. These drugs can create dependence, withdrawal symptoms, daytime drowsiness, tolerance and cognitive impairment. In addition to this, these medications do not address the underlying cause of sleep deficiency. Hence, non-pharmacological therapies are better, among which yoga has gained global attention. These are safe, cost-effective and have no significant side effects.

Yoga is an ancient mind-body practice. Even though yoga has been used as a complementary health approach for enhancing wellness and addressing a variety of health issues, little is known about the impact of yoga on cognitive functioning in adults with mild cognitive impairment (MCI) and dementia[5] and it is a mind-body intervention that works through: Regulation of autonomic nervous system, reduction of sympathetic Insomnia overactivity, yoga enhancement of parasympathetic tone, reduction of cortisol and stress hormones that is a comprehensive system to achieve physical, psychological, and spiritual health and well-being that combines a variety of exercises, breathing practices, relaxation, and meditation techniques. [6] Considering all these, yoga is a low-cost, easily implementable and acceptable to improve the quality of sleep.

Mindfulness, as an important component of yoga, improves sleep disturbance by increasing melatonin levels, reducing hyperarousal, and addressing stress-related cardiac and respiratory abnormalities [7]. Even though it has more significance, scientific evidence is needed more especially among the elderly age group. Therefore, this study was conducted to scientifically evaluate and assess the role of yoga in improving sleep among the elderly population in an urban health setting.

METHODOLOGY

Study Design:

A quasi-experimental study using a pre-test and post-test design without a control group. This design allows evaluation of intervention effectiveness in real-world community settings where randomisation may not be feasible.

Study Setting:

The study was conducted in the yoga centre and MTM clinic in Government Medical College and Hospital, Government Omandurar Estate, Chennai, predominantly to middle- and lower-income elderly populations.

Study Population:

Individuals aged ≥ 40 years diagnosed with insomnia.

Sample size:

A total of 60 participants were included based on feasibility and the expected effect size from similar previous studies.

Sampling Technique:

Convenience sampling was adopted due to easy accessibility, feasibility in OPD settings and time constraints.

Inclusion Criteria: Elderly adults aged 45–85 years with complaints of insomnia as described in the diagnostic criteria of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) who were willing and gave informed consent with the study's protocols and procedures.[8]

Exclusion Criteria:(1) special populations without major mental illnesses (eg, major depression, bipolar disorder, and schizophrenia) and life-threatening illnesses; (2) sleep disorders triggered by psychiatric problems, physiological illnesses, and medications; (3) measurement tools other than the PSQI; (4) no full experimental group or control group and (5) systematic reviews, meta-analyses, theory papers, review articles, animal studies, conference proceedings, economic studies, and case reports.[9]

Study tool:

Pittsburgh Sleep Quality Index: It assesses sleep over the past 1 month. It is a gold standard tool in sleep related researches.

Score > 5 indicates poor sleep quality

Score < 5 indicates good sleep quality

Intervention:

All people who participated in this study are trained in yoga and meditation practice for 3 months continuously by the yoga department in the Government Medical College, Government Omandurar Estate. Yoga instruction is given to the participants twice weekly for 30 minutes. Before starting the class, each participant meets the instructor for around 30 minutes to discuss health concerns and learn the breathing exercise. Each class included breathing exercises, 11 to 13 poses, and deep relaxation featuring Yoga Nidra, which is a meditative practise

Participants have undergone a structured yoga programme including

1. Asanas (Postures)

It reduces muscular tension and improves physical relaxation

2. Pranayama (Breathing Exercises)

It increases the oxygenation and get autonomic balance in body

3. Yoga Nidra

Deep relaxation technique for reducing mental stress

Mechanism:

- Reduces HPA(Hypothalamic-Pituitary-adrenal) axis activation
- Improves vagal tone

- Promotes sleep onset

Procedure:

After getting clearance from the Institutional Ethics Committee and permission from the DEAN of the College, Persons who satisfy the inclusion criteria and are willing to participate are included in the study. Insomnia patients attending the MTM clinic were approached for the study, and based on selection criteria, they were recruited by convenience sampling. The nature and purpose of the study were explained to them, and informed consent was obtained.

BASELINE PHASE-Demographic and clinical data collected

INTERVENTION PHASE-Supervised sessions of yoga twice every month.

Daily home practices.

POST INTERVENTION PHASE-Assessment and collection of clinical data.

Comparison of pre- and post-clinical data.

Statistical analysis:

The method used to create data was based on the significance of the Pittsburgh Insomnia Sleep Index.

Participants assessed with pre data and post yoga data, and then the data was analysed using

Categorical variables expressed as percentages.

The Chi-square test is used to establish the relationship between variables and for comparing the distribution of sleep parameters before and after the intervention of yoga. The McNemar test was applied to evaluate significant changes for paired categorical variables, of pre and post intervention responses from the same participants.

A p-value of less than 0.05 is considered statistically significant. A significant p values obtained in many variables, such as difficulty in falling asleep,

nocturnal awakening indicates intervention of yoga has a significant impact on insomnia patients.

RESULT

A total of 60 elderly individuals aged >40 years with a mean age of 55.13 years were included in the final analysis. All participants completed pre-intervention assessment and then practised yoga for 3 months, and then completed post intervention assessment.

Among 60 participants;

Duration and pattern of insomnia:

- 45% had insomnia for 6 months to 1 year.
- 23.3% had symptoms for less than 6 months.
- 18.3% had symptoms for 1 -3 years
- 13.3% had symptoms for more than 3 years.

Frequency of sleep difficulty

- 53.3%-several nights per week
- 30%- once or twice weekly
- 16.7%- every night

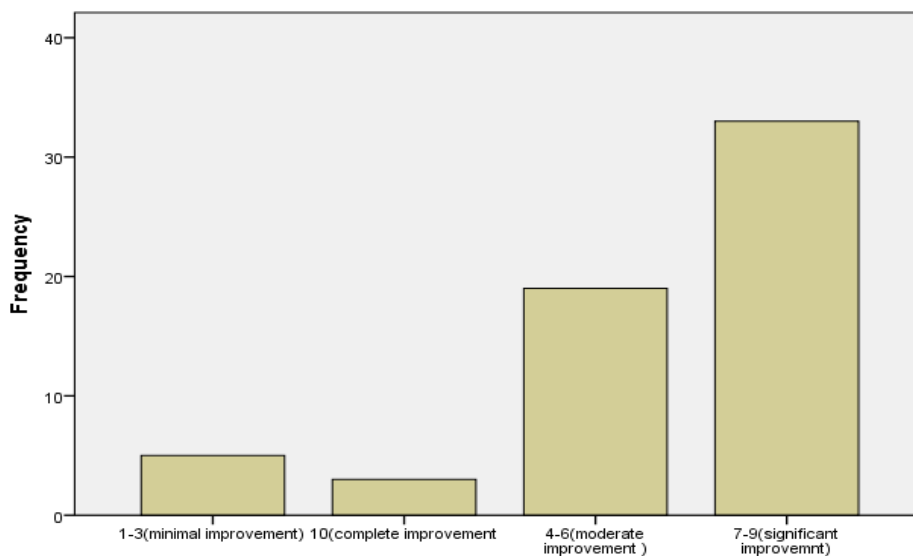
Sleep duration

- 61.7%-slept 4-6 hours.
- 33.3%- slept less than 4 hours.
- 5% -slept for 6 to 8 hours.

Before the intervention of yoga, more than half of the participants (56.7%) were not following any other medications,18.3% took medicines,13.3% used herbal supplements and the rest practised relaxation techniques. Satisfaction with these practices was generally low.

A notable improvement in sleep pattern was observed after the intervention of yoga.

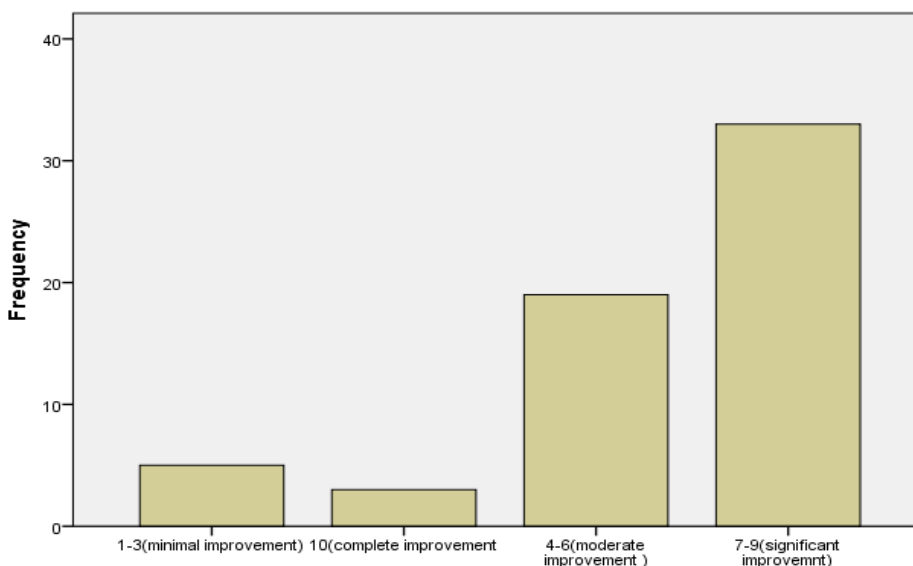
Figure 1: Rating of sleep quality improvement after the intervention of yoga



By the intervention of yoga, psychological parameters of participants also had a positive impact, with the majority (60%) reported somewhat less stressed. 26.7% reported a significant reduction in stress levels. Similarly overall well-being of participants also improved.

Also, following the introduction of yoga, significant improvement was seen in multiple domains like reduced frequency of difficulty in falling asleep, reduced sleep disturbance, etc. And there is a significant reduction in the use of sleep medications, improvement in daytime functioning capacity.

Figure 2: Overall well-being after the introduction of yoga



The paired sample T-test analysis showed strong statistical significance supporting these observations. Significant improvements ($p < 0.001$) were noted in key sleep parameters, like

- Nocturnal awakening
- Sleep onset latency
- Breathing discomfort during sleep
- Bad dreams during sleep
- Overall subjective sleep quality.

However, there are some parameters which do not show statistical significant improvements, like pain during sleep, leg twitching, sensation of feeling too cold or hot while sleeping and other forms of restlessness during sleep. ($P \text{ value} > 0.05$) This could be attributed to other comorbidities of participants or other environmental factors.

Table 1: Association between Pre and Post Yoga study variables

		MEAN		Df	Sig. (2-tailed)
		Pre-intervention	Post intervention		
		Pair 1	Cannot get to sleep within 30 min – Pre and post intervention		
Pair 2	Wake up in the middle of the night or early morning - Pre and post intervention	3.17	2.22	59	.000
Pair 3	Have to get up to use the bathroom - Pre and post intervention	3.22	2.23	59	.000
Pair 4	Cough or snore loudly - Pre and post intervention	3.22	2.25	59	.000
Pair 5	Have pain – Pre and post intervention	2.30	1.41	59	.621
Pair 6	Leg twitching while sleeping – Pre and post intervention	2.25	1.42	59	.221
Pair 7	Cannot breathe comfortably – pre and post intervention	3.22	2.25	59	.000
Pair 8	Had bad dreams - Pre and post intervention	2.35	1.55	59	.000
Pair 9	For the past month, rate your sleep quality – Pre and post intervention	3.22	2.03	59	.000
Pair 10	For the past month, how often have you taken medicine - Pre and post intervention	3.20	2.03	59	.000
Pair 11	For the past month, how often have you had trouble staying awake – Pre and post intervention	3.22	2.05	59	.000
Pair 12	Feel too cold – Pre and post intervention	1.35	1.28	59	.621
Pair 13	feel too hot - Pre and post intervention	1.50	1.33	59	.221
Pair 14	For the past month, have you had any problems keeping up to get things done - Pre and post intervention	3.22	2.00	59	.000
Pair 15	loud snoring – Pre and post intervention	3.23	2.07	59	.000
Pair 16	Long pauses between sleep while asleep - Pre and post intervention	2.18	1.23	59	.000
Pair 17	Episodes of disorientation during work – Pre and post intervention	3.22	2.08	59	.000
Pair 18	Other restlessness while sleeping – Pre and post intervention	1.35	1.28	59	.621

For all the pairs except pair 9, all others have
 1 - Not during the past month 3 – Once or twice in a week

2 - Less than once in a week
 3 times in a week
 For 9th pair,

4 – More than

1 – Very good
2 – Good

3 – Bad
4 – Very bad

This study shows Yoga is an effective non-pharmacological intervention for insomnia and other sleep-related problems and improves sleep quality, enhances psychological well-being.

DISCUSSION

This quasi-experimental study regarding the effectiveness of the intervention of yoga among insomnia patients with insomnia showed that there is a statistically significant improvement in quality and quantity of sleep, evaluating multiple parameters before and after the intervention of yoga, and the study highlights the potential role of yoga as a non-pharmacological therapeutic management of insomnia.

Principle Findings: By analysing the study, a major proportion of participants had Vemoderate to severe insomnia, characterised by reduced sleep duration, frequent nocturnal awakenings and prolonged sleep latency. After the intervention of yoga, there are significant improvements in:

Sleep initiation (reduction in difficulty falling asleep)

- Sleep duration
- Frequency of night awakenings
- Frequency of sleep disturbances
- Subjective sleep quality
- Perceived stress levels.

In addition, training-induced sleep changes appear to be associated with inflammation, with significant reductions in inflammatory cytokine levels being sufficient to improve overall sleep stages since they can increase non-rapid eye movement sleep by impairing a subpopulation of sleep-associated neurons in the preoptic area/basal forebrain.[10][11] Psychological and physiological effects of yoga have contributed to the improvement in the efficiency of yoga.

- It enhanced parasympathetic nervous system activity
- Promoted relaxation of both body and mind,
- Reduced sympathetic overactivity,
- Lower cortisol levels

Reduced stress and anxiety ↓

Thereby Improved melatonin secretion leads to improved sleep regulation.

There is a statistically significant reduction in sleep latency, which shows that:

Yoga helps in calming the mind and body so it prepares for sleep.

Also Improved sleep continuity and reduced physiological arousal resulted in decreased nocturnal awakenings.

The observed reduction in stress among participants shows the mind-body benefits of yoga, because stress is a major contributing factor in the pathogenesis of insomnia.

A significant reduction in sleep latency shows that Yoga helps to calm the mind and body, so it gets ready for sleep.

Also those who practice yoga feel less stressed and resulted in lesser sleep disturbances, and has significant effects on reduced daytime fatigueness, increased productivity and functional capacity, better memory, reduced irritability and very little or no non-restorative sleep habits.

For anxiety, Cognitive Behavioural Therapy(CBT) is the gold standard psychological treatment. Clinical trials of CBT for Generalised anxiety disorder and elevated worry have shown positive effects on sleep[12]

After the yoga sessions, most people in this study said their sleep quality had improved. Over 85% reported moderate to significant improvements. They also had trouble falling asleep and felt more mentally well with lower stress levels. These findings correlate with a systematic review and meta-analysis by Wang et al. (2020), which included 19 randomised controlled trials and established that yoga significantly improves sleep efficiency, with a pooled standardised mean difference of -0.327 ($p < 0.001$). [13]

Another randomised controlled trial by Datta et al. (2021) on yoga nidra in chronic insomnia patients reported major betterment in sleep parameters, including total sleep time and sleep efficiency, and the effectiveness in intervention of yoga in sleep-related queries. [14]

These improvements included sleep time and sleep efficiency, which support the idea that yoga can help with both how people feel about their sleep and actual sleep results.

Similarly, another study by Khalsa and Goldstein (2021) validated that yoga not only improves insomnia symptoms but also produces benefits beyond conventional sleep interventions, with prolonged effects observed for followup period also. [15]

This current study also shows major reductions in stress levels betterment in well-being. This matches with the study by Verma et al. (2022), which reports that yoga improves psychological well-being, diminishes stress, and strengthen quality of life in individuals with insomnia.[16]

The physiological effects of yoga can result in advancement in sleep variables like reduction in sleep latency, awakening while asleep, and better daytime functional capacity. Those studies that were conducted before prove that yoga significantly diminishes hyperarousal, which is a major complaint of insomnia, by energizing para sympathetic system, thereby dropping cortisol levels[17]

During yoga training, different asanas contain various stretches, and these improvements in the PSQI components may reflect the tension-reducing effect of stretching, which may work similarly to progressive muscle relaxation, a well-recognised nonpharmacological treatment for chronic insomnia[18]

Still in our study, certain variables such as pain, leg twitching, and thermal discomfort like feeling too hot or cold, do not show statistically substantial improvement. This finding is supported by previous literature, which suggests that yoga mainly targets psychological and behavioural components of insomnia and not symptoms arising from underlying physical or medical conditions.

Yoga is an acceptable/well-received and highly implementable intervention for use within a population of individuals with self-reported insomnia. This study shows that Yoga Nidra can produce relaxation, as indicated by self-reported physical, mental, and emotional relaxation following the practice. [19]

Yoga effectively improved sleep quality and continuity (sleep latency and efficiency) in older adults with insomnia, shortening the sleep-onset duration, reducing anxiety associated with poor sleep, and improving sleep duration[20]

Here, we can see the findings of this study are consistent with existing evidence, and this further strengthens the role of yoga as an effective, safe, and accessible intervention for insomnia. Compared to pharmacological treatments, yoga offers minimal side effects and improves mental health and quality of life. Yoga participants experienced significant improvements in memory complaints, with improvements in sleep partially mediating this relationship. [21]

From a community medicine perspective, insomnia among the elderly represents a significant public health issue. The prevalence of insomnia increases with age.. Chronic sleep disturbances can worsen already existing other chronic comorbidities and increase the risk of mortality. But it is often neglected. Poor sleep can lead to:

- More prone to chronic diseases
- Reduced functional ability
- Increased healthcare utilisation
- Decreased quality of life

Yoga, as demonstrated in this study, is:

- Cost-effective
- Non-invasive
- Easily implementable in community settings
- Free from major side effects as it is a non-pharmacological

This makes it an ideal intervention for integration into:

- Primary healthcare services
- Geriatric health programs
- Community-based wellness initiatives.

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Data Availability

All data generated or analyzed during this study are included in this published article and its supplementary information files.

Authors' Contributions

Jannathul Firdouse PK ¹: Conceptualization, Methodology, Investigation, Data Curation, Formal Analysis, Writing – Original Draft, Visualization
Indulekha M¹: Conceptualization, Methodology, Investigation, Data Curation, Formal Analysis, Writing – Original Draft, Visualization

Arulmozhi P ²: Conceptualization, Methodology, Validation, Investigation, Writing – Review & Editing, Supervision

Satishkumar K²: Conceptualization, Methodology, Validation, Investigation, Writing – Review & Editing, Supervision

Arun Murugan³: Validation, Writing – Review & Editing, Supervision, Project Administration

¹These authors contributed equally to this work and share first authorship.

Conflicts of Interest

The authors declare no competing interests.

Ethical Considerations

This type of study requires ethical approval and received ethical approval

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PRE-YOGA QUESTIONNAIRE

1. Name
2. Age
3. Gender
4. Residence
5. Occupation

6. By agreeing this form, i agree to participate in this study. A copy of this form has been given to me. If i have any question in the future about this study they will be answered by the investigators. I understand that this consent ends at the conclusion of this study

Yes

No

7. How long have you been experiencing insomnia?

Less than 6 months

6 months to 1 year

1-3 years

More than 3 years

8. How frequently do you experience difficulty falling asleep?

Every night

Several nights a week

Once or twice a week

Rarely

Never

9. On average how many hours of sleep do you get per night?

Less than 4 hours

4-6 hours

6-8 hours

More than 8 hours

10. Have you tried any other methods or treatments to improve your sleep before starting yoga?

Medication

Cognitive behavioral therapy for insomnia (CBT-I)

Herbal suppliments

Meditation or relaxation techniques

None of the above

12. How satisfied are you with the effectiveness of the previous methods or treatments you have tried?

Very satisfied

Somewhat familiar

Neutral

Somewhat dissatisfied

Very dissatisfied

13. How familiar are you with the practise of yoga?

Very familiar

Somewhat familiar

Heard about it. But not familiar

Not familiar at all

14. What are your expectations or goals in practising yoga for insomnia?

Improve sleep quality

Reduce stress and anxiety

Increase relaxation

Enhance overall well-being

Other:

15. Are you currently under the guidance of yoga instructor or are you practising yoga on your own?

Under the guidance of a yoga instructor

Practising yoga on my own

16. Are there any specific yoga poses or techniques that you plan to incorporate into your practise for insomnia?

Deep breathing exercises

Gentle stretching poses

Restorative poses

Meditation and mindfulness

Other:

17. Have you received any professional advice or recommendations from a healthcare provider regarding the use of yoga for insomnia?

Yes

No

For each of the remaining questions check the one best response. Please answer all questions.

During the past month how often you had been had trouble sleeping because you

18. Not during the past month Cannot get to sleep within 30 minutes*

Not in the past month

Less than once a week

Once or twice a week

Three or more times a week

19. Wake up in the middle of the night or early morning

Not during the past month

Less than once a week

Once or twice a week

Three or more times a week

20. Have to get up to use the bathroom

Less than once a week

Once or twice a week

Three or more a week

21. Cough or snore loudly

Not during past month

Less than once a week

Once or twice a week

Three or more a week

22. Cannot breath comfortably

Not during past month

Less than once a week

Once or twice a week

Three or more times a week

23. Feel too cold

Not during the past month

Less than once a week

Once or twice a week

Three or more a week

24. Feel too hot

Not during past month

Less than once a week

Once or twice a week

Thrice or more a week

25. Had bad dreams

Not during last month

Less than once a week

Once or twice a week

Thrice or more a week

26. Have pain

Not during last month

Less than once a week

Once or twice a week

Two or more a week

27. How often during the past month have you had trouble sleeping because of other reasons not mentioned?

Not during last month

Less than once a week

Once or twice a week

Twice or more a week

Sleep

28. During the past month how would you rate your sleep quality overall *

Very good

Fairly good

Fairly bad

Very bad

29. During the past month how often have you taken medicine to help you sleep (prescribed over the counter)

Not during last month

Less than once a week

Once or twice a week

Three or more times a week

30. During the past month how often have you had trouble staying awake while driving eating meals or engaging in social activity?

Not during past month

Less than once a week

Once or twice a week

Three or times a week

31. During past month how much of a problem has it been for you to keep up enough enthusiasm to get things done

Not problem at all

Only a very slight problem

Somewhat of a problem

A very big problem

32. Do you have a bed partner or room mate?

No bed partner or room mate

Partner/roommate in other room

Partner in same room, not same bed

Partner in same bed

Room mate

If you have a roommate or bed partner, ask him/her how often in the past month you have had..

33. Loud snoring

Not during the past month

Less than once a week

Once or twice a week

Three or more times a week

34. Long pauses between breaths while asleep

Not during the past month

Less than once a week

Once or twice a week

Three or more times a week

35. Legs twitching or jerking while you asleep

Not during the past month

Less than once a week

Once or twice a week

Three or more times a week

36. Episodes of disorientation or confusion during sleep

Not during past month

Less than once a week

Once or twice a week

Three or more times a week

37. Other restlessness while you sleep; please prescribe

Not during the past month

Less than once a week

Once or twice a week

Three or more times a week

POST YOGA QUESTIOONAIRE

Name

Age

Gender

Residence

Occupation

Phone number

1. How long have you been practising yoga?

Less than 6 months

6months to one year

One to three year

More than three years

2. How frequently do you practice yoga?

Once a week or less

2-3 times a week

4-5times a week

Daily

3. How long is each yoga session?

Less than 30minutes

30-45 minutes

45minutes to one hour

More than one hour

4. Prior to starting yoga how often did you experience difficulty falling asleep?

Every night

Several nights a week

Once or twice a week

Rarely

Never

5. Since starting yoga how often did you experience difficulty falling asleep?

Every night

Several nights a week

Once or twice a week

Rarely

Never

6. On a scale of 1-10 how would you rate your improvement in sleep quality since starting yoga?

1-3(minimal improvement)

4-6(moderate improvement)

7-9(significant improvement)

10(complete improvement)

7. Have you noticed any changes in your overall stress levels since starting yoga?

Yes i feel significantly less stress

Yes i feel somewhat less stressed

No noticeable change in stress

I feel more stressed

8. How would you rate your overall wellbeing since starting yoga?

Very poor

Poor

Average

Good

Very good

9. Do you incorporate specific yoga poses or techniques that focus on relaxation and sleep promotion?

Yes regularly

Occasionally

Rarely

No, i prefer a general yoga practice

10. Would you recommend yoga to other individuals experiencing insomnia?

Definitely

Probably

Unsure

Probably not

Definitely not

11. During the past month, what time have you usually gone to bed at night?

Time

12. During the past month, how long (in minutes) has it usually taken you to fall asleep each night?

13. During the past month, what time have you usually gotten up in the morning?

Time

During the past month, how many hours of actual sleep did you get at night?

During the past month, how often have you had trouble sleeping because you ;

14. Cannot get to sleep within 30 minutes

Not during the past month

Less than once a week

Once or twice a week

Three or more times a week

15. Wake up in the middle of the night or early morning

Not during the past month

Less than once a week

Once or twice a week

Three or more times a week

16. Have to get up to use the bathroom

Not during the past month

Less than once a week

Once or twice a week

Three or more times a week

17. Cannot breathe comfortably

Not during the past month

Less than once a week

Once or twice a week

Three or more times a week

18. Cough or snore loudly

Not during the past month

Less than once a week

Once or twice a week

Three or more times a week

19. Feel too cold

Not during the past month

Less than once a week

Once or twice a week

Three or more times a week

20. Feel too hot

Not during the past month

Less than once a week

Once or twice a week

Three or more times a week

21. Had bad dreams

Not during the past month

Less than once a week

Once or twice a week

Three or more times a week

22. Have pain

Not during the past month

Less than once a week

Once or twice a week

Three or more times a week

23. How often during the past month have you had trouble sleeping because of other reasons not mentioned?

Not during the past month

Less than once a week

Once or twice a week

Three or more times a week

Sleep

24. During the past month, how would you rate your sleep quality overall?

- Very good
- Fairly good
- Fairly bad
- Very bad

25. During the past month, how often have you taken medicine to help you sleep (prescribed or "over the counter")?

- Not during the past month
- Less than once a week
- Once or twice a week
- Three or more times a week

26. During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activity?

- Not during the past month
- Less than once a week
- Once or twice a week
- Three or more times a week

27. During the past month, how much of a problem has it been for you to keep up enough enthusiasm to get things done?

- No problem at all
- Only a very slight problem
- Somewhat of a problem
- A very big problem

28. Do you have a bed partner or room mate?

- No bed partner or room mate
- Partner/roommate in other room
- Partner in same room, not same bed
- Partner in same

Room mate

If you have a room mate or bed partner, ask him/her how often in the past month you have had . . .

29. Loud snoring

- Not during the past month
- Less than once a week
- Once or twice a week
- Three or more times a week

30. Long pauses between breaths while asleep

- Not during the past month
- Less than once a week
- Once or twice a week
- Three or more times a week

31. Legs twitching or jerking while you sleep

- Not during the past month
- Less than once a week
- Once or twice a week
- Three or more times a week

32. Episodes of disorientation or confusion during sleep

- Not during the past month
- Less than once a week

Once or twice a week

Three or more times a week

33. Other restlessness while you sleep; please describe

Not during the past month

Less than once a week

Once or twice a week

Three or more times a week.

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