



Research Article

A SURVEY STUDY TO EVALUATE THE EFFECTIVENESS OF *TARPANA* ON SLEEP IMPROVEMENT USING A STANDARDIZED SLEEP QUALITY SCALE

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ABSTRACT

Sleep disorders are increasingly recognized as significant contributors to both systemic and ocular health issues, with poor sleep quality strongly linked to the incidence and severity of dry eye disease. The eye, as an extension of the brain, contains intricate neural, vascular, and immune networks that closely connect ocular physiology with sleep regulation. Modern studies highlight the role of melatonin in maintaining circadian rhythm, protecting the blood-retinal barrier, reducing oxidative stress, and regulating intraocular pressure, emphasizing the bidirectional relationship between sleep and ocular function. In Ayurveda, *Tarpana*, a *Netrakriyakalpa* procedure under *Bahya Snehana* (external oleation), is indicated for nourishing and stabilizing ocular tissues, calming the nervous system, and promoting mental relaxation. *Acharya Vagbhata* explains that *Snehana* strengthens the *Indriyas* and balances *Vata* and *Pitta*, the *Doshas* often aggravated in sleep disturbances. The present survey-based study was conducted among 100 participant's to evaluated the effectiveness of *Tarpana* on sleep patterns using a standardized sleep quality scale assessed before and after the intervention. The findings revealed significant improvements in overall sleep quality and timely awakening following *Tarpana*.

INTRODUCTION

Sleep is a vital physiological process essential for neural restoration, metabolic balance, and ocular health. The sleep cycle, comprising rapid-eye-movement (REM) and non-rapid-eye-movement (NREM) phases, ensures neuro-ocular synchronization and overall well-being.^[1] Emerging evidence highlights a strong association between sleep disturbances and ocular surface disorders, particularly dry eye disease, where disrupted sleep exacerbates inflammation, oxidative stress, and tear film instability, leading to visual discomfort and reduced quality of life.^[2] Modern neuro-ophthalmic research emphasizes the regulatory role of melatonin secreted by both the pineal gland and ocular tissues in maintaining circadian rhythm and ocular health.^[3]

It supports angiogenesis, strengthens the blood-retinal barrier, reduces oxidative damage, and protects retinal neurons from inflammatory and degenerative changes. This underscores the bidirectional communication between the brain, sleep physiology, and ocular function.

In Ayurveda, *Nidra* is one of the *Trayopastambha* (Three pillars of life) and is considered essential for maintaining physical, mental, and sensory health.^[4] *Akshi Tarpana*, comes under *Bahya Snehana* (external oleation), involves retaining medicated *Ghrita* (ghee) over the eyes, enabling deeper penetration and nourishment of ocular structures. Classical texts describe its benefits in strengthening the *Indriyas*, relieving ocular strain, calming the nervous system, and promoting mental relaxation-qualities that align with healthy sleep regulation. *Samyak Tarpita Lakshana* include *Sukhaswapna* (sound sleep), *Avbodhatva* (refreshing awakening), *Vaishadhy* (clarity of vision), *Varnapatava* (accurate color perception), *Nivriti* (ocular comfort), *Vyadhividhvansa* (reduction of eye-related discomfort), *Kriya Laghava* (effortless blinking and movements),

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and *Prakash Kshamatva* (improved tolerance to bright light).^[5] This survey-based study assesses sleep patterns before and after the administration of *Tarpana* using a standardized sleep quality scale.^[6] By integrating classical Ayurvedic principles with contemporary scientific perspectives, the study seeks to provide evidence-based insights into the potential of *Tarpana* in enhancing neuro-ocular health and overall well-being.

Previous studies have demonstrated the efficacy of *Akshitarpana* in managing *Netra rogas* like *Timira*, *Shushkashipaka* (dry eye) etc. However, no studies have specifically investigated the effect of *Akshi tarpana* on sleep quality using standard sleep assessment scale.

AIM

To study the effect of *Tarpana* on *Nidra*.

OBJECTIVES

- To assess the difference in sleep pattern before and after *Tarpana*.
- To evaluate the efficacy of *Akshi Tarpana* in sleep assessment using a standard sleep quality scale.

MATERIAL AND METHODS

A survey study was conducted on 100 patients from the OPD and IPD of Sri Kalabhyraveswara Swamy Ayurvedic Medical College and Hospital to evaluate the effect of *Tarpana* on sleep quality. The

Assessment criteria

participants were divided into 2 phase- Phase 1 (before *Tarpana*) and Phase 2 (after *Tarpana*). A sleep quality scale was used for the assessment, evaluation was carried out by considering the parameters of *Nidra* and its *Lakshanas* described in the *Charaka Samhita*, as well as the *Samyak Tarpita Lakshanas* mentioned in the *Sushruta Samhita*, *Uttara Tantra*. The data were collected systematically and subjected to analysis.

Inclusion criteria

- Patients belonging to the age group of 16-80 years, of either gender.
- Patients with irrespective of disease where *Tarpana* is indicated.

Exclusion criteria

- Children aged below 16 years.
- Pregnant and lactating women.
- Patients with infection and inflammatory changes
- Patients with psychiatric or psychological disorders, including stress, anxiety, depression, schizophrenia, or other mental illnesses that may influence the study outcomes.
- Patients with *Ama Lakshana* and *Tarpana Anarha*.

Sleep Quality Scale

	Rarely	Sometimes	Often	Almost always
I have difficulty falling sleep				
I fall into a deep sleep				
I wake up while sleeping				
I have difficulty getting back to sleep once I wake up in middle of the night				
I wake up easily because of noise				
I toss and turn				
I never go back to sleep after awakening during sleep				
I feel refreshed after sleep				
I feel unlikely to sleep after sleep				
Poor sleep gives me headache				
Poor sleep cause me to make mistakes at work				
I have difficulty getting out of bed				
Poor sleep makes me lose desire in all things				
Sleepiness interferes with my daily life.				
Poor sleep makes me forget things more easily				
I am satisfied with my sleep				

Poor sleep makes me irritated				
I would like to sleep more after waking up				
My sleep hours are enough				
Poor sleep makes me loose appetite				
Poor sleep makes hard for me to think				
I feel vigorous after sleep				
Poor sleep makes me loose interest in work or others				
My fatigue is relieved after sleep				
Poor sleep makes me easily tired at work				
I have clear head after sleep				
Poor sleep makes my life painful				

Statistical analysis for assessing sleep quality between BT-AT was carried out using Unpaired 't' test by using SPSS 16.0 Software

RESULTS AND DISCUSSION

Observation

Age

Age in yrs	Number of patients	Percentage
16-25	25	25%
26-35	18	18%
36-45	21	21%
46-55	12	12%
56-65	5	5%
66-75	15	15%
76-80	4	4%

Sex

Gender	Number of patients	Percentage
Female	68	68%
Male	32	32%

Prakruthi

Prakruthi	Number of Patients	Percentage
Vata pitta	58	58%
Pitta kapha	23	23%
Kapha vata	19	19%

Occupation

Occupation	Number of Patients	Percentage
Students	35	35%
Screen based occupation	33	33%
Home makers	20	20%
Retired	12	12%

Disease

Disease	Number of patients	Percentage
Myopia	32	32 %
Dry eye	39	39%
Presbyopia	29	29%

Sleep pattern

Sleep pattern	Number of patients	Percentage
Sound	36	36%
Disturbed	64	64%

Parameters

	Before Tarpana	After Tarpana
I have difficulty falling sleep	84	4
I fall into a deep sleep	41	100
I wake up while sleeping	75	10
I have difficulty getting back to sleep once I wake up in middle of the night	76	0
I wake up easily because of noise	78	12
I toss and turn	89	0
I never go back to sleep after awakening during sleep	40	0
I feel refreshed after sleep	12	100
I feel unlikely to sleep after sleep	10	100
Poor sleep gives me headache	82	3
Poor sleep cause me to make mistakes at work	39	6
I have difficulty getting out of bed	98	10
Poor sleep makes me lose desire in all things	69	2
Sleepiness interferes with my daily life.	88	0
Poor sleep makes me forget things more easily	67	0
I am satisfied with my sleep	23	100
Poor sleep makes me irritated	79	0
I would like to sleep more after waking up	98	0
My sleep hours are enough	23	100
Poor sleep makes me loose appetite	29	0
Poor sleep makes hard for me to think	79	0
I feel vigorous after sleep	23	100
Poor sleep makes me loose interest in work or others	98	0
My fatigue is relieved after sleep	12	100
Poor sleep makes me easily tired at work	87	100
I have clear head after sleep	23	100
Poor sleep makes my life painful	0	0

RESULTS

I have difficulty falling sleep	n	Mean	MD	SD	SE	t value	p value	Remarks
BT-AT	100	2.41	2.37	1.35	0.14	17.382	P<0.0001	Highly Significant

I fall into a deep sleep	n	Mean	MD	SD	SE	t value	p value	Remarks
BT- AT	100	1.15	2.07	0.44	0.08	-24.63	P<0.001	Highly significant

I wake up while sleeping	n	Mean	MD	SD	SE	t value	p value	Remarks
BT_- AT	100	2.20	2.07	0.79	0.11	18.399	P<0.001	Significant

I have difficulty getting back to sleep once I wake up in middle of the night	n	Mean	MD	SD	SE	t value	p value	Remarks
BT-AT	100	0.99	0.99	0.73	0.10	9.5232	p<0.001	Highly significant

I wake up easily because of noise	n	Mean	MD	SD	SE	t value	p value	Remarks
BT-AT	100	0.90	0.90	0.62	0.09	10.3402	P<0.001	Highly significant

I toss and turn	n	Mean	MD	SD	SE	t value	p value	Remarks
BT-AT	100	0.43	0.43	0.39	0.06	7.7458	P<0.001	Highly significant

I never go back to sleep after awakening during sleep	n	Mean	MD	SD	SE	t value	p value	Remarks
BT- AT	100	0.44	0.44	0.45	0.06	7.0429	P<0.001	Highly significant

I feel refreshed after sleep	n	Mean	MD	SD	SE	t value	p value	Remarks
BT-AT	100	0.81	1.90	0.73	0.10	18.53	P<0.001	Highly significant

I feel unlikely to sleep after sleep	n	Mean	MD	SD	SE	t value	p value	Remarks
BT-AT	100	0.33	2.43	0.85	0.12	-20.26	P<0.001	Highly significant

Poor sleep gives me headache	n	Mean	MD	SD	SE	t value	p value	Remarks
BT-AT	100	0.64	0.63	0.69	0.10	6.46	P<0.001	Highly significant

Poor sleep cause me to make mistakes at work	n	Mean	MD	SD	SE	t value	p value	Remarks
BT-AT	100	0.34	0.34	0.36	0.05	6.579	P<0.001	Highly significant

I have difficulty getting out of bed	n	Mean	MD	SD	SE	t value	p value	Remarks
BT-AT	100	2.47	2.29	0.71	0.10	22.8229	P<0.001	Highly significant

Poor sleep makes my life painful	n	Mean	MD	SD	SE	t value	p value	Remarks
BT-AT	100	0	0	0	0	0	0	Non-significant

Poor sleep makes hard for me to think	n	Mean	MD	SD	SE	t value	p value	Remarks
BT-AT	100	0.95	13.26	0.51	0.07	13.26	P<0.001	Highly significant

Poor sleep makes me lose appetite	n	Mean	MD	SD	SE	t value	p value	Remarks
BT-AT	100	0.34	0.34	0.36	0.005	6.579	P<0.001	Highly significant

My sleep hours are enough	n	Mean	MD	SD	SE	t value	p value	Remarks
BT-AT	100	0.46	2.37	1.35	0.14	-37.85	P<0.001	Highly significant

I would like to sleep more after waking up	n	Mean	MD	SD	SE	t value	p value	Remarks
BT-AT	100	2.20	2.07	0.79	0.11	18.399	P<0.001	Significant

Poor sleep makes me irritated	n	Mean	MD	SD	SE	t value	p value	Remarks
BT-AT	100	0.60	0.60	0.59	0.08	7.1354	P<0.001	Highly significant

I am satisfied with my sleep	n	Mean	MD	SD	SE	t value	p value	Remarks
BT-AT	100	0.46	2.37	1.35	0.14	-37.85	P<0.001	Highly significant

Poor sleep makes me forget things more easily	n	Mean	MD	SD	SE	t value	p value	Remarks
BT-AT	100	0.21	0.19	0.19	0.05	3.9811	P<0.001	Highly significant

Sleepiness interferes with my daily life.	n	Mean	MD	SD	SE	t value	p value	Remarks
BT-AT	100	1.16	0.22	0.05	0.02	22.78	P<0.001	Highly significant

Poor sleep makes me lose desire in all things	n	Mean	MD	SD	SE	t value	p value	Remarks
BT-AT	100	0.60	0.60	0.59	0.08	7.1354	P<0.001	Highly significant

Poor sleep makes me easily tired at work	n	Mean	MD	SD	SE	t value	p value	Remarks
BT-AT	100	0.34	0.34	0.36	0.05	6.579	P<0.001	Highly significant

Poor sleep makes me easily tired at work	n	Mean	MD	SD	SE	t value	p value	Remarks
BT-AT	100	0.64	0.63	0.69	0.10	6.46	P<0.001	Highly significant

My fatigue is relieved after sleep	n	Mean	MD	SD	SE	t value	p value	Remarks
BT-AT	100	0.95	13.26	0.51	0.07	13.26	P<0.001	Highly Significant

Poor sleep makes me loose interest in work or others	n	Mean	MD	SD	SE	t value	p value	Remarks
BT- AT	100	0.95	13.26	0.51	0.007	13.26	P<0.001	Highly significant

I feel vigorous after sleep	n	Mean	MD	SD	SE	t value	p value	Remarks
BT-AT	100	0.46	2.37	1.35	0.14	-37.85	P<0.001	Highly significant

I have clear head after sleep	n	Mean	MD	SD	SE	t value	p value	Remarks
BT-AT	100	0.46	2.37	1.35	0.14	-37.85	P<0.001	Highly significant

DISCUSSION

In the present study, a significant improvement was observed in all domains of the Sleep Quality Scale following *Netra Tarpana*. The improvements included reduced difficulty in initiating and maintaining sleep, deeper and more refreshing sleep, fewer nocturnal awakenings, improved daytime alertness, reduced fatigue, enhanced concentration and memory, better mood, and improved overall quality of life. These findings suggest that *Tarpana* positively influences both nocturnal sleep and daytime functioning.

According to Ayurveda, *Nidra* is produced when the *Manas* and *Indriyas* withdraw from their respective objects under the influence of *Kapha Dosha* and *Tamo Guna*.^[7] Excessive visual activity, prolonged exposure to screens, stress, and mental exertion aggravate *Vata* and *Pitta*, resulting in ocular fatigue, mental restlessness, and disturbed sleep. *Netra Tarpana*, being *Snigdha*, *Guru*, and *Sheeta* in nature, pacifies *Vata* and *Pitta*, nourishes the *Netra*, relieves eye strain, and induces relaxation to the *Netra*.

As the eyes are the predominant *Jnanendriya*, their relaxation facilitates *Indriya Uparama* (withdrawal of the sense organs), which is an

important event in the *Samprapti* of *Nidra*.^[8] The *Snigdha* and *Guru* qualities of *Ghritha* also promote *Kapha*, thereby supporting the physiological process of *Swabhavika Nidra*.

From a modern pharmacological perspective, the eye is increasingly regarded as an extension of the central nervous system due to its direct embryological and anatomical connections. Experimental and preclinical studies suggest that substances administered via the ocular route may reach the brain through neuro-ophthalmic pathways, including the optic nerve, trigeminal nerve, and associated periocular lymphatic and perivascular channels, thereby partially bypassing the blood-brain barrier. This eye-to-brain transport has primarily been demonstrated using advanced ophthalmic drug-delivery systems such as nanoparticles, liposomes, nanoemulsions, and in situ gelling formulations, which are designed to enhance permeability and provide sustained release.^[9]

Participants also exhibited the classical signs of successful *Netra Tarpana* described in *Ayurveda*, including *Avabodhatva* (blissful awakening),

Vaishadhya (clearness of the eyes), *Varnapatava* (better colour perception), *Nivriti* (a sense of comfort), *Kriya Laghava* (ease in opening and closing the eyes), *Prakash Kshamatva* (improved tolerance to bright light), and *Vyadhi Vidhvamsa* (relief from disease symptoms).

CONCLUSION

The present survey study demonstrated significant improvement in sleep quality following *Netra Tarpana*, as assessed using a standardized Sleep Quality Scale. Improvement was observed in various domains of sleep, including sleep initiation, sleep maintenance, sleep duration, day time functioning, and overall sleep satisfaction. Participants also exhibited the *Samyak lakshana* of *Tarpana* described in Ayurveda, indicating improved ocular comfort and general well-being. The findings of this study support the role of *Netra Tarpana* as a safe and effective Ayurvedic procedure for promoting healthy sleep and enhancing quality of life. Further research incorporating both subjective sleep assessment scales and objective parameters may provide a more comprehensive understanding of the effect of *Netra Tarpana* on sleep.

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