WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.084
Volume 11, Issue 16, 353-416. Review Article ISSN 2277– 7105

INSOMNIA

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Article Received on
30 September 2022,
Revised on 20 Oct. 2022,
Accepted on 10 Nov. 2022
DOI: 10.20959/wjpr202216-26181

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ABSTRACT

Herbal medications are in significant demand for primary healthcare in bothdeveloped and developing countries because of their broad biological activities, higher safety margins, and lower costs. Herbs are used in traditional medicine for treatment of various disease. Insomnia is the most common type of sleep disorder in population. It is defined as persistent difficulty initiating or maintaining sleep, or reports of unpleasant sleep with associated daytime impairment. Insomnia is a significant population health problem due to its high prevalence and management challenges. There is much evidence of a strong association between insomnia and various medical and psychiatric coexisting condition. Insomnia diagnosis and treatment planning depend on a thorough sleep history to address contributing and precipitating factors as well as maladaptive behaviors that result in poor sleep. Use of sleep diaries or sleep logs is more accurate in determining sleep patterns than patient recall. A sleep study is not routinely indicated for the evaluation of insomnia. Cognitive behavioral therapy for insomnia (CBT-I) is the main bone of treatment and is a safe and effective approach. A major challenge of CBT-I is the lack of therapists to implement it. Newer-generation nonbenzodiazepines (eg, zolpidem, zaleplon) are used as first-line pharmacotherapy for chronic insomnia. New drugs active at targets other than the gamma-aminobutyric acid receptor are now available, but clear treatment guidelines are needed. The present review focuses on detailed information about insomnia and it's treatment chemical or herbal.

KEYWORDS: Herbs are used in traditional medicine for treatment of various disease.

1. INTRODUCTION

1.1.1 "what is sleep" and it's necessity.

1.1 Sleep

Before knowing insomnia as a disease, it's good to know about Our Ancient scientist and intellectual Maharshi Charak said

देहवृत्तौ यथाऽऽहारः तथा स्वप्नः सुखो मतः

Meaning:- Sleep is considered to be as pleasant as food in the functioning of the body.
Sleep is a necessity God has made some rules to live life, by following which we can live a healthy and happy life. Sleep is also one such thing. God has made the day for work and the night for rest. But in today's age of rapid industrialization giving us enough time to sleep seems unnecessary. We always have one thing in our mind - 'I don't have time'. ' And as this mindset grows, we cut back on sleep time. One of the major pitfalls of today's age is that we prefer to work less during the day, and are only interested in working late into the night. But whatever we do during the day we can do only on the basis of night sleep. Each person's sleep needs are different depending on their age.[1]

Sleep is a naturally recurring state of mind and body, characterized by altered consciousness, relatively inhibited sensory activity, reduced muscle activity and inhibition of nearly all voluntary muscles during rapid eye movement (REM) sleep, and reduced interactions with surroundings. It is distinguished from wakefulness by a decreased ability to react to stimuli, but more reactive than a coma or disorders of consciousness, with sleep displaying different, active brain patterns.

- *-How much sleep we need by age is described below

Figure -1

- In this way, every person should get enough sleep according to his age and need, and if he gets into the habit of sleeping more than the time mentioned above, it is harmful to health. People who do mental work need a little more sleep, and the direction in which we face also affects our health.[1]

1.1.2 Which is the best direction to sleep?

Earth has a very large gravitational force. That energy has a north pole and a south pole. Similarly, there is gravity within the human body. Our head is the North Pole and our feet are the South Pole. So when we sleep with our heads in different directions, it has different effects on our body and mind. Its details are given below.[1]

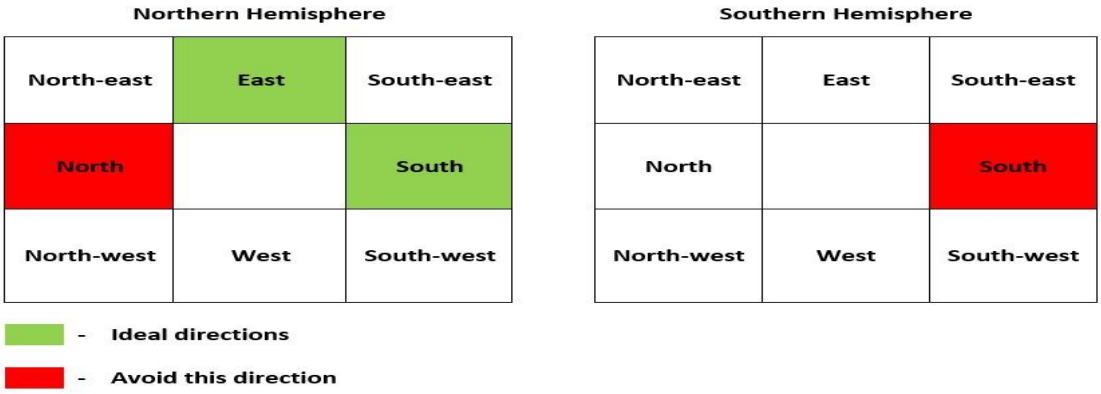

Figure – 2.

- **North Direction**

When our head is in the north direction, the north pole of the earth and the north pole of our body become in the same direction. So the following effect takes place. Force of repulsion is produced in the body — the heart etc. organs of the body feel constricted → blood pressure increases, sleep-related diseases increase, the possibility of tamoguni (related to fear, violence, anger etc.) dreams increases. So sleeping with head in north direction is harmful.[1]

- **South Direction**

When our head is in the south direction, the north pole of the earth and the south pole of our body become in the same direction. So the following effect takes place. Force of Attraction is produced in the body. → Relaxation occurs in body parts → BodyRelaxed → Blood pressure remains normal → Sleep is better, but the possibility of lucid dreams increases. So South direction is good for sleep, but not good for those who follow Brahmacharya (Celibacy).[1]

- **East Direction**

The body remains neutral due to the force of attraction or repulsion - blood pressure etc. body condition remains normal → deep sleep and the effect of Rajoguna - Tamoguna is reduced → East direction is very beneficial for sleep and observance of celibacy.[1]

- **West Direction**

Ayurveda is silent about this direction. Scientists have not yet done complete research on this direction. So South and East are respectively best for sleep.

1.1.3 CAUSES OF INSOMNIA

Today, many people have many sleep problems at a young age. Today, 65% of the youth and 72% of the elderly in the world suffer from insomnia. Mostly the person himself is responsible for creating such problems. If proper attention is not given to this, then these problems result in illness. And in the long run it causes many other diseases. Some of these problems are discussed here.[1]

- **Anticipation of wrong needs for sleep**

Today all facilities are available to make one's life comfortable. So one's desires also increase to get those facilities like, good big bed to sleep, favorite pillow, noise-free room, A.C. in summer. Etc... until such facilities set in the mind for sleep are not met, the mind becomes a big hindrance to the body to sleep. So one should make a habit of sleeping very happily and without creating unnecessary needs.

- **Lack of thought planning power**

Normally every human being has about 70,000 thoughts per day. A person thinks about work during the day and stays awake late at night thinking the same thoughts while sleeping. But this way is completely wrong. People think so much even at night that those thoughts prevent them from getting deep sleep. And as a result the second day is also spent very dry. Therefore, a person has to waste four to five hours on the work which can be easily done in one hour during the day.

So *thoughts that burden the brain at night should always be removed.* And if you really want to have a good night's sleep, it is beneficial to meditate or spend some relaxing time with your family during this time. So our thoughts are the cause of our irregular sleep. So when and how much to think, its management must be learned.

- **Irregular Lifestyle**

Nowadays, people are happy to stay up late at night and work. But the quality of sleep is connected with Melatonin hormone. And that hormone is more active from 10 pm to 5 am. So sleep at that time is more beneficial for the body. The sleep taken by the same person for the same hours at different times of the night has completely different effects on the body. Its details are given below. The sleep chain is so important that all the balance of the body depends on it. As the sleep chain breaks down, digestive system diseases enter the body first. And after that many diseases enter the body gradually. Therefore, people who work late at night and do not get up early in the morning, they can become victims of digestive system related diseases from a young age.[1]

1.1.4 Remedies for insomnia Note

Do not take intoxicants, sour and spicy substances before sleeping at night. Addiction to alcohol and cigarettes causes permanent sleep disorders.[1]

- *Any of the following exercises can be used for better sleep.*

1. Before going to bed, wash your hands and feet with cold water, rub ghee on the soles of your feet and forehead.
2. Put 2-2 drops of cow's ghee in both nostrils.
3. Take 2 to 4 grams of Ashwagandha powder with milk at night.
4. Take 4 grams of crushed poppy seed with sugar and honey or with sugar and ghee while sleeping at night.
5. Add sugar and powdered sugar to the milk and drink it after boiling.
6. Add 2 spoons of honey in 1 cup of warm milk and drink it.
7. Take quarter of ground nutmeg with water.
8. Drink half a cup of amla juice before going to bed.
9. Eating 2 ripe bananas before going to bed will help you sleep better.
10. At night, put a little salt in warm water and keep the soles of the feet in it for 5 to 10 minutes. Then rub desi castor with a bowl.
11. Drinking buffalo milk before going to bed is best for inducing sleep.

These above details are as per Ayuraved, Below details are as per medical science

1.2 Insomnia as per Clinical view

1.2 .1 INSOMNIA

- **DEFINITION**

People with insomnia, commonly referred to as sleeplessness, have problems falling asleep. They can have trouble getting asleep or remaining asleep for the required amount of time. Daytime tiredness, low energy, irritability, and a gloomy mood are frequently experienced after insomnia. It could lead to difficulties concentrating and learning, as well as a higher risk of car accidents. Long-term insomnia can continue longer than a month, while short-term insomnia might last for days or weeks.[3]

- **SYMPTOMS**

Symptoms of insomnia

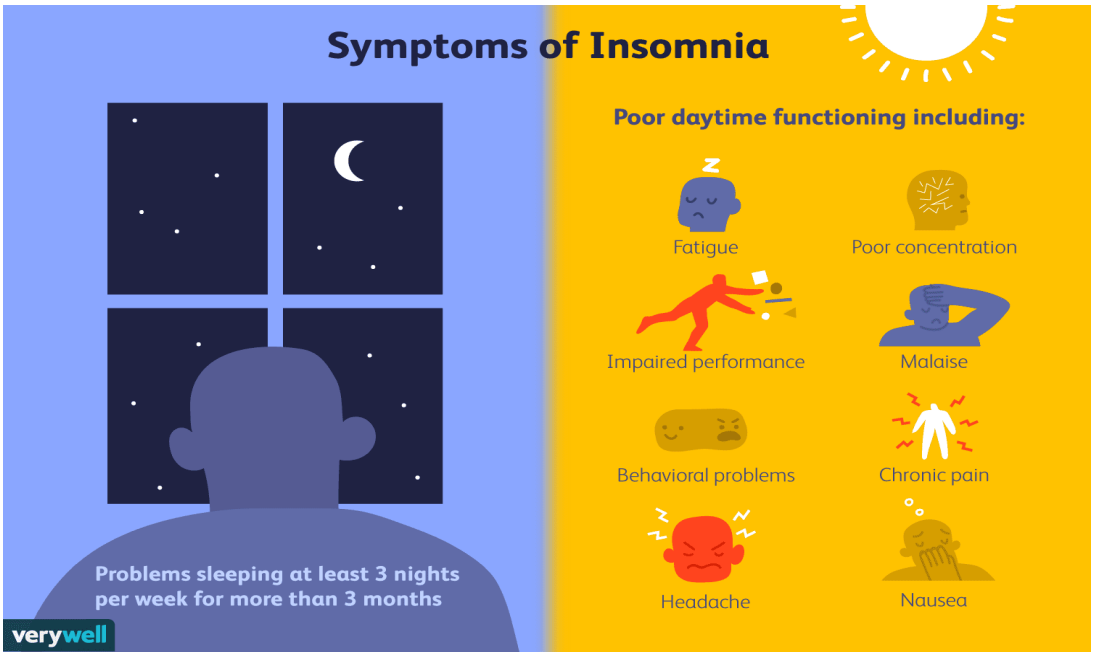

Figure – 3.

Difficulty sleeping, including difficulty finding a comfortable sleeping position

Night waking, not getting back to sleep and waking up early

Not being able to concentrate on daily tasks, difficulty remembering

Daytime sleepiness, irritability, depression or anxiety

Feeling tired or low energy during the day

Difficulty concentrating

Being irritable, aggressive or impulsive

Sleep-onset insomnia is difficulty falling asleep early in the night, which is often a symptom of anxiety disorders.

Delayed sleep phase disorder can be misdiagnosed as insomnia, sleepiness.

The onset is much later than usual when the awakening spreads into the daylight hours.

Nocturnal awakenings and difficulty returning to sleep are common in patients who have difficulty falling asleep.

Two-thirds of these patients wake up in the middle of the night, with more than half having trouble going back to sleep after the middle-of-the-night awakening.

Early morning awakenings are awakenings with an inability to go back to sleep earlier than desired (more than 30 minutes) and before total sleep time reaches 6.5 hours. Waking up early in the morning is often a symptom of depression.

Anxiety symptoms can lead to insomnia. Some of these symptoms include stress, compulsive worry about the future, overstimulation, and overanalyzing past events.

Poor sleep quality can result from, for example, restless legs, sleep apnea or major depression.

Poor sleep quality is defined as a person not reaching stage 3 or delta sleep which has restorative properties.

Major depression leads to changes in the function of the hypothalamic-pituitary-adrenal axis, causing excessive release of cortisol that can lead to poor sleep quality.

Nocturnal polyuria, excessive nighttime urination, can also affect sleep quality.

Some cases of insomnia are not really insomnia in the traditional sense, as people experiencing a false sleep state often sleep for a normal amount of time. The problem is, despite sleeping several hours each night and usually not experiencing significant daytime sleepiness or other symptoms of sleep loss, they don't feel like they've slept much, if at all.

Because their perception of their sleep is incomplete, they falsely believe that it takes them an unusually long time to fall asleep, and they underestimate how long they sleep.[4]

1.2.2 CAUSES AS PER MEDICAL SCIENCE

Figure – 4

Symptoms of insomnia can be caused by or be associated with Sleep breathing disorders, such as sleep apnea or upper airway resistance syndrome.

Use of psychoactive drugs (such as stimulants), including certain drugs, herbs, caffeine, nicotine, cocaine, amphetamines, methylphenidate, aripiprazole, MDMA, modafinil, or excessive alcohol consumption.

Use or withdrawal of alcohol and other sedatives, such as anti-anxiety and sleep medications such as -*-benzodiazepines.

Use or withdrawal of pain-relieving medications such as opioids.[5]

- **Heart disease**

Restless legs syndrome, which can cause sleep-onset insomnia due to uncomfortable sensations experienced and the need to move the legs or other body parts to relieve these sensations.

Periodic limb movement disorder (PLMD), which occurs during sleep and can cause arousals of which the sleeper is unaware.

- **Pain**

An injury or condition that causes pain can prevent a person from finding a comfortable sleeping position, and can also cause awakenings.

Hormone shifts such as before menstruation and during menopause

Life events such as fear, stress, anxiety, emotional or mental stress, work problems, financial stress, childbirth and bereavement. Gastrointestinal problems such as heartburn or constipation.

Psychiatric, neurobehavioral or neurodevelopmental disorders such as bipolar disorder, clinical depression, generalized anxiety disorder, post-traumatic stress disorder, schizophrenia, obsessive compulsive disorder, autism, dementia,:326 ADHD, Asperger syndrome and FASD.

Circadian rhythm disturbances, such as shift work and jet lag, can cause an inability to fall asleep at certain times of the day and excessive sleepiness at other times of the day. Chronic circadian rhythm disorder is characterized by similar symptoms.

A history of certain neurological disorders such as brain lesions or traumatic brain injury

Medical conditions such as hyperthyroidism

Abuse of over-the-counter or prescription sleep aids (sedatives or depressants) can cause rebound insomnia.

Poor sleep hygiene, eg, noise or excessive caffeine intake

A rare genetic condition can cause prion-dependent, permanent and eventually fatal insomnia called fatal familial insomnia.

Physical exercise: Exercise-induced insomnia is common in athletes in the form of prolonged sleep onset delay.

Increased exposure to blue light from artificial sources such as phones or computers.[6]

- **Chronic pain**

Pain in the lower back.

- **Asthma**

Sleep studies using polysomnography have suggested that people with sleep disturbances have increased levels of circulating cortisol and adrenocorticotropic hormone during the night.

They also have an elevated metabolic rate, which is not the case in people who do not have insomnia but whose sleep has been deliberately disrupted during a sleep study.

Studies of brain metabolism using positron emission tomography (PET) scans indicate that people with insomnia have higher metabolic rates at night and during the day. The question remains whether these changes are causes or consequences of long-term insomnia.

- **Genetics**

Heritability estimates for insomnia vary between 38% in males to 59% in females.[41] A genome-wide association study (GWAS) identified 3 genomic loci and 7 genes that influence the risk of insomnia, showing that insomnia is highly polygenic.[42] In particular, a strong positive association was observed for the MEIS1 gene in both males and females.

This study shows that the genetic architecture of insomnia strongly overlaps with psychiatric disorders and metabolic traits.

It has been hypothesized that epigenetics may also influence insomnia through control processes of both sleep regulation and the brain-stress response, and may also affect brain plasticity.

- **substance-induced**
- **alcohol-induced**

Main article: Alcohol use and sleep

Alcohol is often used as a form of insomnia self-medication to induce sleep. However, using alcohol to induce sleep can cause insomnia.

Long-term alcohol use is associated with a reduction in NREM stage 3 and 4 sleep as well as suppression of REM sleep and REM sleep fragmentation. Frequent tossing and turning between sleep stages, accompanied by headache, need to urinate, dehydration and arousal due to excessive sweating.

Glutamine rebound also plays a role when a person is drinking; Alcohol inhibits glutamine, one of the body's natural stimulants. When a person stops drinking, the body tries to make up for lost time by producing more glutamine than it needs.[7]

Increased glutamine levels stimulate the brain when the drinker is trying to sleep, preventing it from reaching the deepest levels of sleep. Stopping chronic alcohol use can also cause severe insomnia with vivid dreams. REM sleep during withdrawal is usually exaggerated as part of the rebound effect.

- **benzodiazepine-induced**

Like alcohol, benzodiazepines, such as alprazolam, clonazepam, lorazepam, and diazepam, are commonly used in the short-term to treat insomnia (both prescribed and self-medicated), but worsen sleep in the long-term. While benzodiazepines increase tendency to put people to sleep (i.e., inhibit NREM stages 1 and 2 sleep), once asleep, the drugs disrupt sleep

architecture: shortening sleep time, delaying REM sleep time, and Decreased deep slow-wave sleep (the most restorative part of sleep for both energy and mood).

- **opioid-induced**

Opioid medications such as hydrocodone, oxycodone, and morphine are used for insomnia associated with pain due to their analgesic properties and hypnotic effects. Opioids can disrupt sleep and reduce REM and stage 2 sleep. By producing analgesia and sedation, opioids may be appropriate in carefully selected patients with pain-related insomnia. However, dependence on opioids can lead to long-term sleep disturbances.[8]

1.2.3 Risk factors

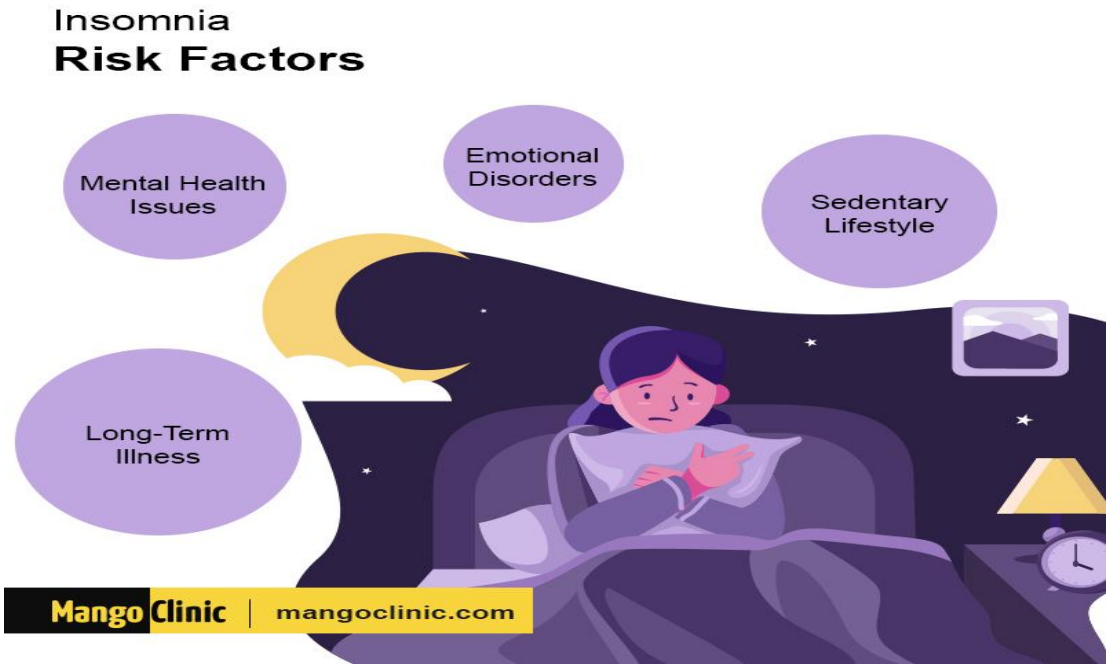

Figure - 5

- Insomnia affects people of all age groups but the following groups are more likely to suffer from insomnia:

Persons above 60 years of age

History of mental health disorders including depression etc.

emotional stress

Working late night shift

Traveling through different time zones

Having chronic diseases such as diabetes, kidney disease, lung disease, Alzheimer's or heart disease

Alcohol or drug use disorders

Gastrointestinal reflux disease

Heavy smoking

Work stress

Night study habits

1.2.4 Mechanism

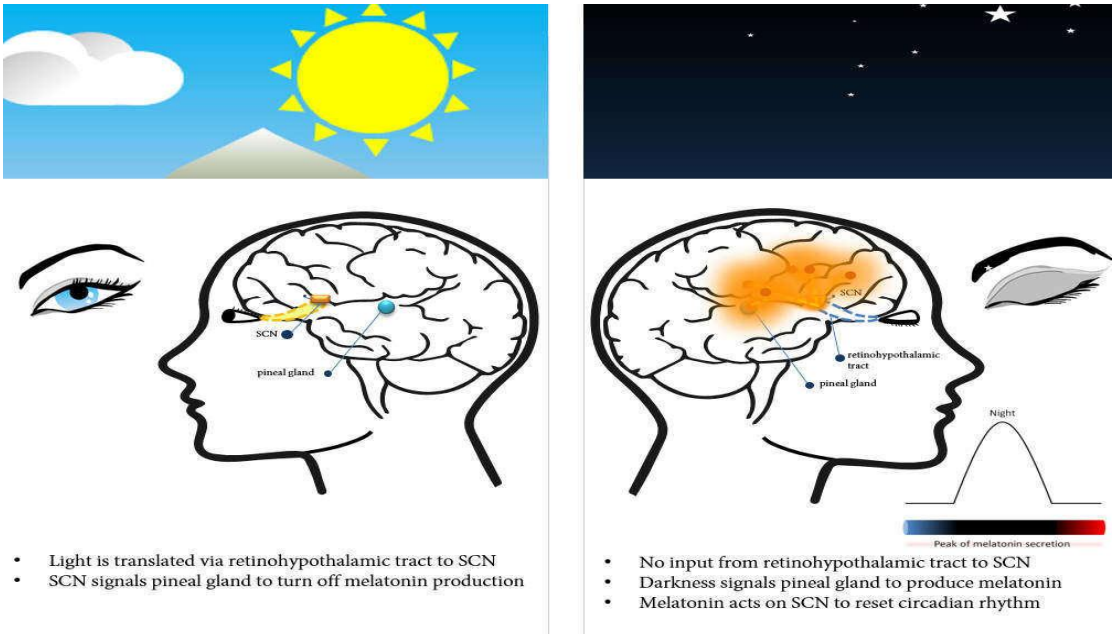

Figure- 6.

Two main models exist for the mechanism of insomnia, cognitive and physiological. The cognitive model suggests that regret and hypersensitivity contribute to a person's inability to fall asleep and may lead to episodes of insomnia.

The physiological model is based on three key findings in people with insomnia; First, increased urinary cortisol and catecholamines indicate increased activity of the HPA axis and arousal; second, increased global cerebral glucose consumption during wakefulness and NREM sleep in insomniacs; And finally, whole body metabolism and heart rate increase in people with insomnia.[9]

Taken together, these findings suggest dysregulation of the arousal system, cognitive system, and HPA axis contribute to insomnia. However, it is unknown whether hypersensitivity is a consequence or a cause of insomnia. Altered levels of the inhibitory neurotransmitter GABA have been found, but results have been inconsistent, and the implications of altered levels of such a ubiquitous neurotransmitter are unknown.

Studies on whether insomnia is driven by circadian control of sleep or a wake-dependent process have shown inconsistent results, but some literature suggests dysregulation of circadian rhythms based on core temperature. Increased beta activity and decreased delta wave activity have been observed on electroencephalograms; However, the meaning of this is unknown.

About half of postmenopausal women experience sleep disturbances, and sleep disturbances are usually about twice as common in women as in men; It appears to be partially, but not entirely, due to changes in hormone levels, especially during and after menopause.

Changes in sex hormones in both men and women may account for the increased prevalence of sleep disorders in older people due to age.[10]

1.2.5 Diagnosis

Figure – 7

In medicine, insomnia is widely measured using the Athens Insomnia Scale. It is measured using eight different parameters related to sleep, which are finally presented as an overall scale that assesses the individual's sleep patterns.

A proper sleep specialist should be consulted for diagnosis of any sleep disorder so that appropriate measures can be taken. A past medical history and physical examination are needed to rule out other conditions that may be causing insomnia. After ruling out all other conditions, a comprehensive sleep history should be taken. A sleep history should include sleep habits, medications (prescription and non-prescription), alcohol consumption, nicotine and caffeine consumption, co-morbid illnesses, and sleep environment.[59] A sleep diary can be used to monitor a person's sleep patterns. The diary should include sleep time, total sleep time, sleep time, number of awakenings, medication use, wake time, and subjective feelings

in the morning. A sleep diary can be replaced or validated by the use of outpatient actigraphy for a week or more, using a non-invasive device that measures movement.[11]

Workers who complain of insomnia should not routinely undergo polysomnography to screen for sleep disorders. This test may be indicated for patients with symptoms in addition to insomnia, including sleep apnea, obesity, a thickened neck diameter, or high-risk meatus in the oropharynx. Usually, no tests are needed to make a diagnosis, and insomnia, especially for working people, can often be treated by changing work schedules to make time for adequate sleep and improving sleep hygiene.

Some patients may need an overnight sleep study to determine if insomnia is present. Such studies typically include assessment tools including polysomnograms and multiple sleep latency tests. Sleep medicine specialists are qualified to diagnose disorders in 81 major sleep disorder diagnostic categories, according to the ICSD. Patients with some disorders, including delayed sleep phase disorder, are often misdiagnosed with primary insomnia; When a person has trouble falling asleep and waking up at the desired time, but has a normal sleep pattern once asleep, a circadian rhythm disorder is a likely cause.[12]

In many cases, insomnia is co-morbid with another disease, medication side effect, or psychological problem. About half of all diagnosed insomnia is related to psychiatric disorders. For people with depression, "insomnia should be considered a co-morbid condition rather than a secondary one;" Insomnia commonly predicts psychotic symptoms. "In fact, it is possible that insomnia represents a significant risk for the development of subsequent psychiatric disorders." Insomnia is present in 60% to 80% of people with depression. This may be due in part to the treatment used for depression.

Determination of cause is not necessary for diagnosis.

➢ **DSM-5 criteria**

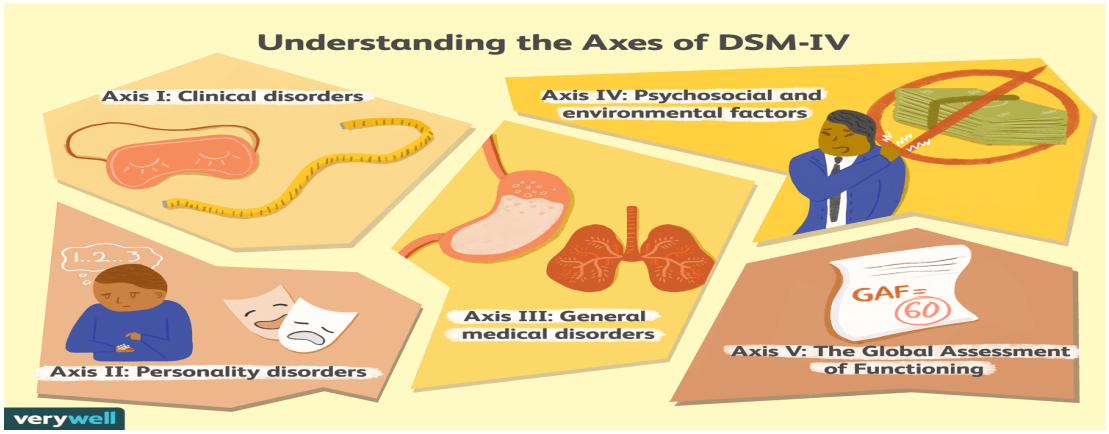

Figure – 8

➢ **DSM-5 criteria for insomnia include**

The chief complaint is dissatisfaction with sleep quantity or quality, associated with one (or more) of the following symptoms: Difficulty initiating sleep. (In children, this may cause difficulty in sleep without guidance giver intervention.)

Difficulty maintaining deep sleep, described by frequent awakenings or problem in returning to sleep after awakening. (In children, this may consider as difficulty returning to sleep without caregiver intervention.)

Early morning awakening with unability to return to sleep.

➢ **Additionally**

Sleep disturbances cause clinically significant distress or impairment in social, occupational, educational, academic, behavioral, or other important areas of functioning.

Trouble sleeping occurs at least 3 nights a week. Sleep problems last for at least 3 months.

Difficulty sleeping despite adequate sleep opportunities.

Insomnia is not better explained and does not occur exclusively during other sleep-wake disorders (eg, narcolepsy, breathing-related sleep disorder, circadian rhythm sleep-wake disorder, parasomnias).

Insomnia is not attributable to the physical effects of a substance (eg, drug of abuse, medication). Coexisting psychiatric disorders and medical conditions do not adequately explain the chief complaint of insomnia.[13]

1.2.6 TYPES OF INSOMNIA

Insomnia is classified as transient, acute, or chronic.

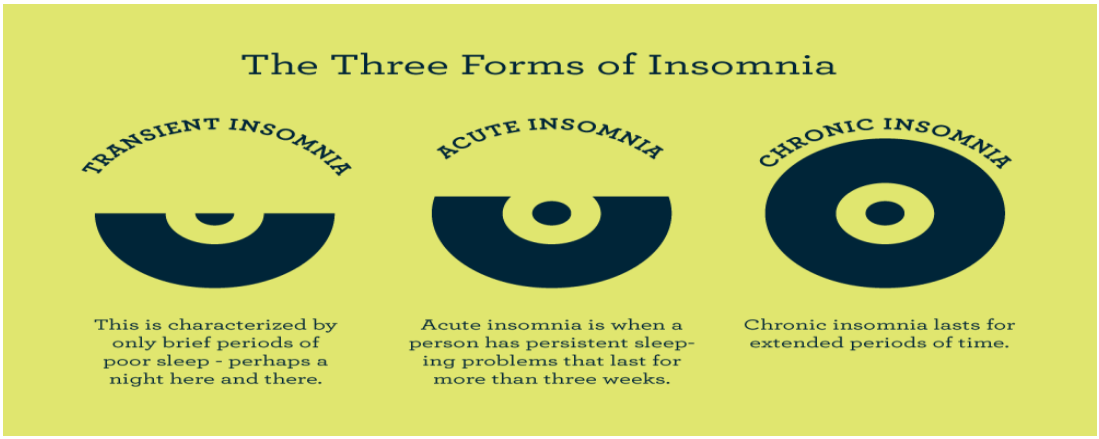

Figure – 9.

- **Transient insomnia**

stay less than a week. It can be caused by other disorders, by changes in sleep environment, by sleep timing, by severe depression or stress. Its consequences—drowsiness and impaired psychomotor performance—are similar to those of sleep deprivation.

- **Chronic insomnia**

Is the inability to sleep well consistently for a period of less than a month. Insomnia occurs when there is difficulty initiating or maintaining sleep, or when the sleep received is unrefreshing or of poor quality. These problems occur despite adequate sleep opportunities and circumstances and result in problems with daytime functioning. Short term insomnia is also known as acute insomnia or stress related insomnia.[14]

Chronic insomnia lasts more than a month. It mostly caused by another disorder, or it can be a first stage disorder. Common causes of chronic insomnia include chronic stress, trauma, work schedules, poor sleep habits, medications, and other mental health disorders. People with high levels of stress hormones or altered levels of cytokines are more likely than others to develop chronic insomnia. Its effects may vary according to its causes. These may include muscular fatigue, hallucinations and/or mental fatigue.

1.2.7 Prevention

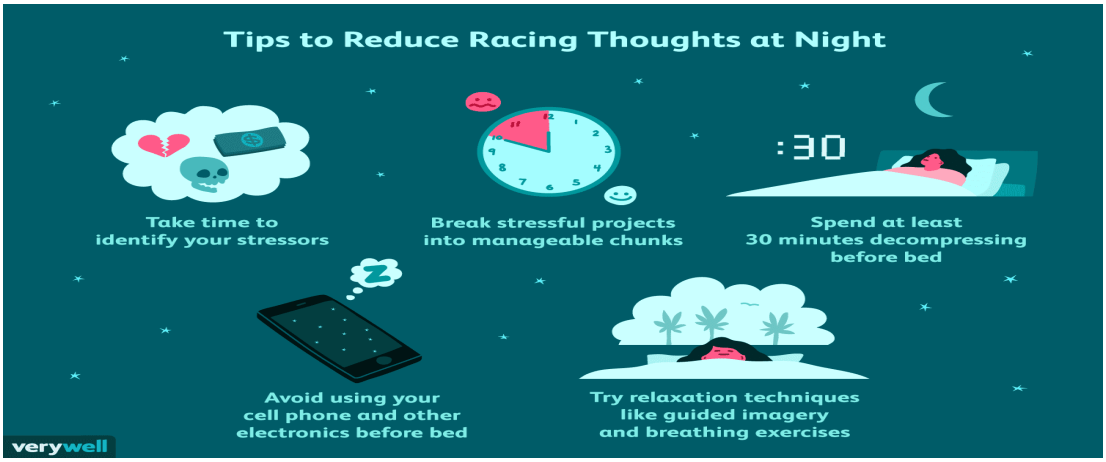

Figure – 10

Prevention and treatment of insomnia may require a combination of cognitive behavioral therapy, medications, and lifestyle changes.

Among lifestyle practices, going to bed and waking up at the same time each day can create a stable pattern that can help prevent insomnia.

Avoiding vigorous exercise and caffeinated beverages a few hours before bedtime is recommended, while exercise earlier in the day may be beneficial. Other methods to improve sleep hygiene may include.[15]

- Avoiding or limiting sleep, Treatment of pain at bedtime
- Avoiding large meals, drinks, alcohol and nicotine before bedtime
- Finding soothing ways to relax into sleep, including using white noise
- Make the bedroom suitable for sleep by keeping it dark, cool and free of devices such as clocks, cell phones or televisions, Maintain regular exercise
- Try to do relaxing activities before bed

1.2.8 Management

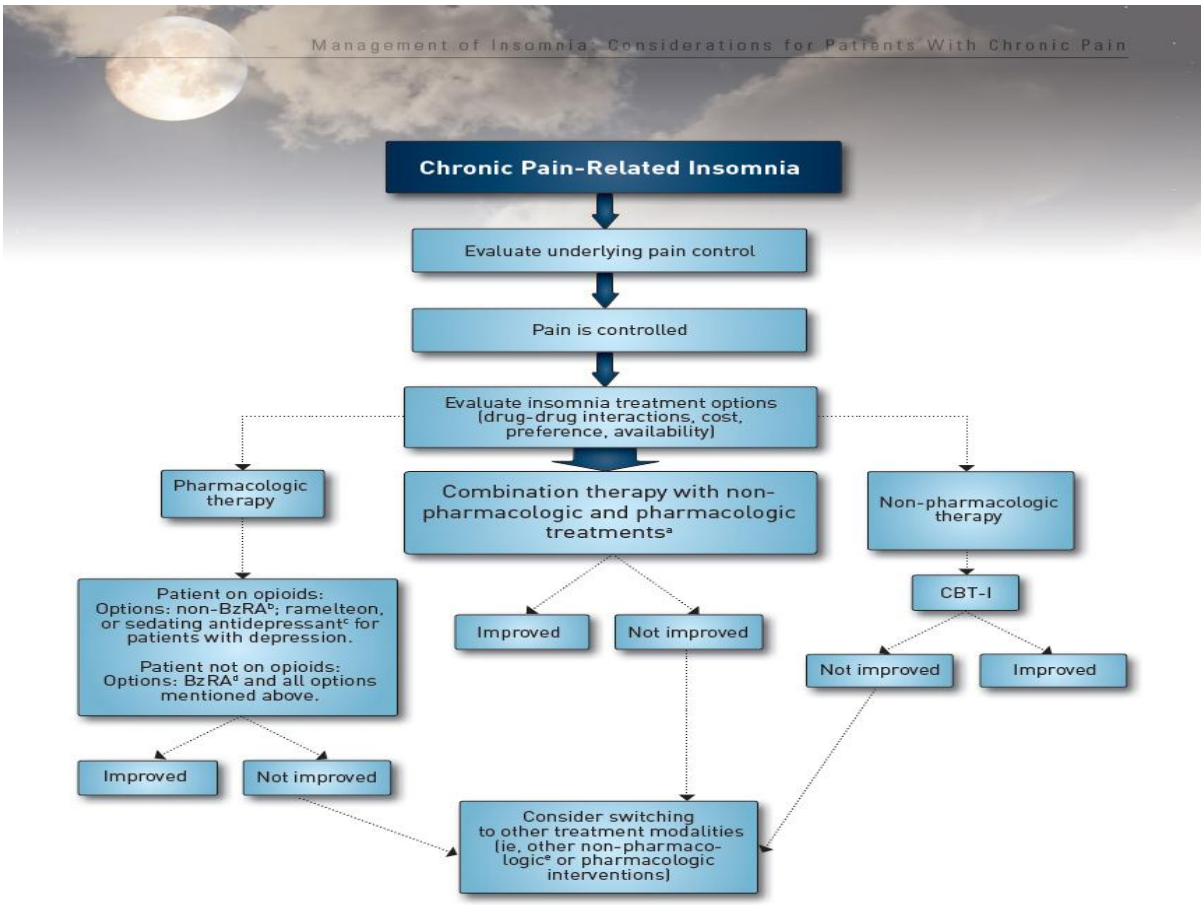

Figure. Treatment algorithm for the management of insomnia in patients with chronic pain.
BzRA, benzodiazepine receptor agonist; CBT-I, cognitive behavioral therapy for insomnia
[a] Preferred treatment.
[b] Examples of non-BzRA: eszopiclone, zaleplon, zolpidem, zolpidem CR.
[c] Examples of sedating antidepressants: amitriptyline, doxepin, mirtazapine, trazodone.
[d] Examples of BzRA: estazolam, flurazepam quazepam, triazolam, temazepam.
[e] Examples of other non-pharmacologic treatments: stimulus control, relaxation training, sleep restriction, paradoxical intention, biofeedback, sleep hygiene, and multicomponent therapy.

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Figure - 11

it is recommended to rule out medical and psychological causes of insomnia before deciding on treatment. Cognitive behavioral therapy is usually the first line treatment once this occurs.[16]

It has been found to be effective for chronic insomnia. Beneficial effects, unlike those produced by drugs, may persist well after discontinuation of therapy.

- Medications are mainly used to reduce symptoms in short-term insomnia; Their role in the management of chronic insomnia remains unclear.

A variety of medications can be used. Many doctors do not recommend relying on prescription sleeping pills for long-term use. It's also important to identify and treat other medical conditions that contribute to insomnia, such as depression, breathing problems, and

chronic pain. By 2022, many people with insomnia reported not getting enough sleep or insomnia treatment overall.[17]

- **Non-drug based**

Non-pharmacological strategies for insomnia have comparable efficacy to hypnotic drugs and may have long-lasting effects. Hypnotic medication is recommended for short-term use only as dependence may develop upon discontinuation or with rebound withdrawal effects on tolerance.

Non-pharmacological strategies provide long-term improvements in insomnia and are recommended as first-line and long-term management strategies.

Behavioral sleep medicine (BSM) attempts to treat insomnia with non-pharmacological treatments. BSM strategies used to address chronic insomnia include sleep hygiene, arousal control, behavioral interventions, sleep-restriction therapy, counterintuition, patient education, and relaxation therapy.

Some examples are keeping a journal, limiting time spent awake in bed, practicing relaxation techniques, and maintaining a regular sleep schedule and wake time. Behavioral therapy can help the patient develop new sleep behaviors to improve sleep quality and consolidation.[18]

Behavioral therapy may include learning healthy sleep habits to promote sleep relaxation, undergoing light therapy to help with anxiety-reduction strategies, and regulating the circadian clock.

- **-Music**

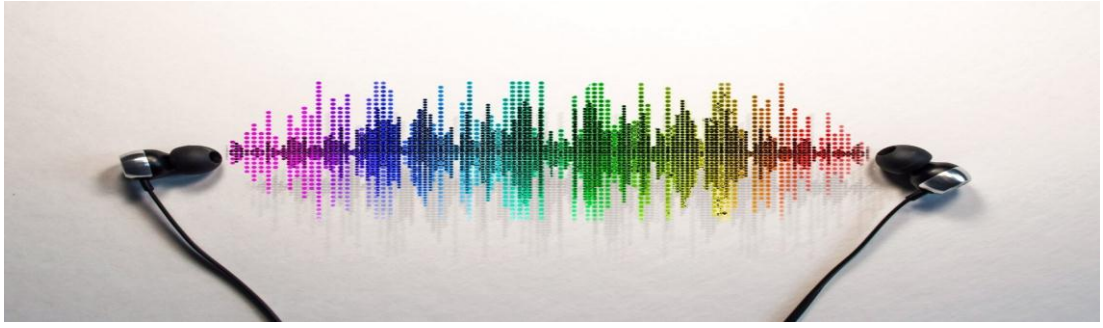


Figure -12

May improve insomnia in adults (see Music and Sleep). EEG biofeedback has shown efficacy in treating insomnia with improvements in sleep duration and quality. Self-help

therapy (defined as a psychological therapy that can be employed on the individual's own) may improve sleep quality to a small or moderate degree for adults with insomnia.

Stimulus control therapy is a treatment for patients who have conditioned themselves to sleep with a negative response, with a bed or in general. Because stimulus control therapy involves taking steps to regulate the sleep environment, it is sometimes referred to interchangeably with the concept of sleep hygiene. Examples of such environmental changes include using the bed only for sleep and sex, not for activities such as reading or watching television; waking up at the same time every morning, including weekends; Going to bed only when sleepy and when there is a high probability of falling asleep; get out of bed and begin activity elsewhere if sleep does not occur within a reasonably short period of time after lying in bed (usually ~20 minutes); reducing subjective effort and energy spent trying to fall asleep; Avoiding exposure to bright light at night and eliminating daytime napping.[19]

One component of stimulus control therapy is sleep restriction, a technique that aims to match time spent in bed with actual time spent asleep. This technique involves maintaining a strict sleep-wake schedule, going to bed at certain times of the day, and specific times to induce light sleep deprivation. Complete treatment usually lasts 3 weeks and involves sleeping for at least as long as they are actually able on average, and then, if able (i.e. when sleep efficiency improves), gradually Gradually increase this amount (~15 minutes) by going to bed earlier as the body tries to reset its internal sleep clock. Bright light therapy can be effective for insomnia.[20]

Contradictory intention is a cognitive reframing technique where the insomniac, instead of trying to fall asleep at night, makes every effort to stay awake (i.e. essentially stops trying to fall asleep). One theory that may explain the effectiveness of this method is that by not voluntarily putting oneself to sleep, it is a passive task that relieves performance anxiety arising from the need or need to fall asleep. This technique has been shown to reduce sleep effort and performance anxiety and to reduce subjective assessments of sleep onset latency and overestimation of sleep deficits (a quality seen in many insomniacs).

- **Sleep hygiene**

Figure -13

Sleep hygiene is a general term for all behaviors that promote good sleep. It includes habits that provide a good foundation for sleep and help prevent insomnia. However, sleep hygiene alone may not be sufficient to overcome chronic insomnia.[21]

Sleep hygiene recommendations are commonly included as a component of cognitive behavioral therapy for insomnia (CBT-I). Recommendations include reducing caffeine, nicotine, and alcohol intake, increasing the regularity and efficiency of sleep episodes, reducing medication use and daytime napping, promoting regular exercise, and facilitating a positive sleep environment.

Creating a positive sleep environment may also help reduce insomnia symptoms.

- **Cognitive behavioral therapy**

Figure - 14

Main article: Cognitive behavioral therapy for insomnia

There is some evidence that cognitive behavioral therapy for insomnia (CBT-I) is superior to long-term benzodiazepines and nonbenzodiazepines in the treatment and management of insomnia. In this therapy, patients are improved sleeping habits and freed from counter-productive assumptions about sleep. Common misconceptions and expectations that can be corrected include.[21]

Unrealistic sleep expectations. Misconceptions about the causes of insomnia. Expanding on the consequences of insomnia Performance anxiety after trying so long to get a good night's sleep by controlling the sleep process.

Numerous studies have reported positive results of combining cognitive behavioral therapy for the treatment of insomnia with treatments such as arousal control and relaxation therapy. Hypnotic drugs are equally effective in the short-term treatment of insomnia, but their effects wear off over time due to tolerance. The effect of CBT-I in the treatment of insomnia has been sustained and sustained long after treatment has been discontinued.[93][94] Addition of hypnotic drugs to CBT-I did not appear to improve insomnia. The long-term benefits of a course of CBT-I show superiority over pharmacological hypnotic drugs. Even in the short term, when compared with short-term hypnotic drugs such as zolpidem, CBT-I still shows significant superiority. CBT-I is thus recommended as a first-line treatment for insomnia.[95]

Common forms of CBT-I treatment include arousal control therapy, sleep restriction, sleep hygiene, improving the sleep environment, relaxation training, counterintuitive intention, and biofeedback.

CBT is a well-accepted form of treatment for insomnia because it has no known adverse effects, whereas medication to relieve insomnia symptoms has been associated with adverse side effects. However, the downside of CBT is that it can take a lot of time and motivation.

Metacognition is a recent trend toward insomnia behavior therapy.

1.2.9 Medications

Many people with insomnia use sleeping pills and other sedatives. In some places drugs are prescribed in more than 95% of cases. However, they are second-line treatment. In 2019, the US Food and Drug Administration said it would require warnings for azopiclone, zaleplon, and zolpidem, due to concerns about serious injuries resulting from abnormal sleep behaviors, including sleepwalking or driving.[22]

The percentage of adults using prescription sleep aids increases with age. During 2005–2010, about 4% of US adults aged 20 and older reported that they had taken prescription sleep aids in the past 30 days. The rate of use was lowest at about 2% among the youngest age group (20–39 year olds), increased to 6% among 50–59 year olds, and reached 7% among those 80 and older. More adult women (5%) than adult men (3%) reported using prescription sleep aids. Non-Hispanic white adults reported greater use of sleep aids (5%) than non-Hispanic black (3%) and Mexican-American (2%) adults. No differences were shown between non-Hispanic black adults and Mexican-American adults in the use of prescription sleep aids.[24]

1.2.9.1 Antihistamines

As an alternative to taking prescription drugs, some evidence shows that the average person seeking short-term relief may find relief with an over-the-counter antihistamine such as diphenhydramine or doxylamine.[110] Diphenhydramine and doxylamine are widely used nonprescription sleep aids. They are the most effective over-the-counter sedatives currently available, at least in Europe, Canada, Australia, and the United States, and are more sedating than some prescription hypnotics. The effectiveness of antihistamines for sleep may decrease over time, and anticholinergic side effects (such as dry mouth) may also be a drawback of these particular medications. While addiction does not appear to be a problem with this class of drugs, they can induce dependence and produce rebound effects upon abrupt cessation of use. However, in people whose insomnia is caused by restless legs syndrome, symptoms may worsen with antihistamines.

1.2.9.2 Antidepressants

Figure – 15

While insomnia is a common symptom of depression, antidepressants are effective for treating sleep problems whether or not they are associated with depression.

While all antidepressants help regulate sleep, some antidepressants such as amitriptyline, doxepin, mirtazapine, and trazodone can have an immediate sedative effect and are prescribed to treat insomnia.

Both amitriptyline and doxepin have antihistaminergic, anticholinergic, and antiadrenergic properties,

which contribute to both their therapeutic effects and side effect profiles, whereas mirtazapine's side effects are primarily antihistaminergic, and trazodone's side effects are primarily antiadrenergic.

Mirtazapine is known to reduce sleep latency (i.e., the time it takes to fall asleep), promote sleep efficiency, and increase the amount of total sleep time in people with both depression and insomnia.

Agomelatine, a melatonergic antidepressant claimed to have sleep-enhancing properties that do not cause daytime drowsiness.

Is approved in the European Union and Australia for the treatment of depression despite no sleep status. After trials in the United States, its development for use there was halted in October 2011 by Novartis,

which bought the rights to market it there from the European pharmaceutical company Servier.[25]

A 2018 Cochrane review found the safety of taking antidepressants for insomnia to be uncertain with no evidence supporting long-term use.

1.2.9.3 Melatonin agonists

Figure -16

Melatonin receptor agonists such as melatonin and ramelteon are used in the treatment of insomnia. The evidence for melatonin in the treatment of insomnia is generally weak.

There is low-quality evidence that it can speed up sleep onset by 6 minutes. Ramelteon does not appear to induce sleep or speed up the amount of sleep a person gets. The use of melatonin as a treatment for insomnia increased from .4% between 1999 and 2000 to about 2.1% between 2017 and 2018. Most melatonin agonists have not been tested for long-term side effects. Sustained-release melatonin can improve sleep quality in older people with minimal side effects.[26]

Studies have also shown that children who are on the autism spectrum or have learning disabilities, attention-deficit hyperactivity disorder (ADHD) or related neurological diseases can benefit from the use of melatonin. This is because they often have trouble sleeping due to their disorders. For example, children with ADHD have trouble sleeping because of their hyperactivity and, as a result, are tired most of the day.

Another cause of insomnia in children with ADHD is the use of stimulants used to treat their disorder. Children who have ADHD, as well as other disorders mentioned, may be given melatonin at bedtime to help them sleep.

1.2.9.4 Benzodiazepines

Figure – 17

The most commonly used class of hypnotics for insomnia is the benzodiazepines.:¸ 363 Benzodiazepines are not significantly better than antidepressants for insomnia.[27]

Chronic users of sleeping pills for insomnia do not sleep better than chronic insomniacs not taking drugs. In fact, chronic users of hypnotics have more regular night awakenings than people who do not take hypnotics. Many have concluded that these drugs pose an unreasonable risk to individual and public health and lack evidence of long-term effectiveness. It is preferable that hypnotics be prescribed at the lowest effective dose for only a few days and avoided altogether wherever possible, especially in the elderly.

Between 1993 and 2010, the prescription of benzodiazepines to individuals with sleep disorders decreased from 24% to 11% in the US, coinciding with the first release of non-benzodiazepines.[28]

Benzodiazepine and nonbenzodiazepine hypnotics also have a number of side effects such as daytime fatigue, motor vehicle accidents and other accidents, cognitive impairments, and falls and fractures. Older people are more susceptible to these side effects. Some benzodiazepines have shown efficacy in maintaining sleep in the short-term but long-term benzodiazepines can lead to tolerance, physical dependence, benzodiazepine withdrawal syndrome upon discontinuation, and long-term deterioration of sleep after long-term continuous use. Benzodiazepines, while inducing sedation, actually disrupt sleep—like alcohol—they promote light sleep by reducing the time spent in deep sleep. A further problem is that, with regular use of short-acting sleep aids for insomnia, daytime anxiety may emerge.

Despite little evidence of benefit for benzodiazepines in insomnia compared with other treatments and evidence of major harms, prescriptions continue to increase. This is probably due to their addictive nature, both because of abuse and because - through their rapid action, tolerance and withdrawal they can "trick" insomnia into thinking they are helping sleep. There is a general awareness that long-term use of benzodiazepines for insomnia is inappropriate in most people, and gradual withdrawal is generally beneficial and recommended whenever possible because of the adverse effects associated with long-term use of benzodiazepines.[29]

Benzodiazepines bind nonselectively to all GABAA receptors. Some theories suggest that certain benzodiazepines (hypnotic benzodiazepines) have significantly greater activity at the α1 subunit of the GABAA receptor than other benzodiazepines (for example, triazolam and temazepam have significantly greater activity at the α1 subunit than alprazolam and diazepam. -Hypnotics - Alprazolam and diazepam, in turn, has greater activity on the α2 subunit than triazolam and temazepam, making them superior anxiolytic agents). Modulation of the α1 subunit has been associated with sedation, motor impairment, respiratory depression, amnesia, ataxia, and reinforced behavior (drug-seeking behavior). Modulation of the α2 subunit is associated with anxiolytic activity and disinhibition. For this reason, certain benzodiazepines may be better suited to treating insomnia than others.[29]

1.2.9.5 Z-Drugs

Figure -18

Nonbenzodiazepine or Z-drug sedative–hypnotic drugs, such as zolpidem, zaleplon, zopiclone, and azopiclone, are a class of hypnotic drugs that are similar in their mechanism of action to benzodiazepines, and are prescribed for mild to moderate insomnia. Their effectiveness in improving sleep time is modest, and they have a similar—though potentially less severe—side effect profile compared to benzodiazepines.[140] There has been a general increase in the prescribing of nonbenzodiazepines since their initial release to the US market in 1992, from 2.3% in 1993 to 13.7% in 2010 among individuals with sleep disorders.[29]

- **Orexin antagonists**

Orexin receptor antagonists are a more recently introduced class of sleep medications and include suvorexant, lemborexant, and daridorexant, all of which are FDA-approved for treatment of insomnia characterized by difficulties with sleep onset and/or sleep maintenance.[30]

- **Antipsychotics**

Some atypical antipsychotics, particularly quetiapine, olanzapine, and risperidone, are used in the treatment of insomnia. However, although common, the use of antipsychotics for this indication is not recommended because the evidence does not show benefit and the risk of adverse effects is significant. Concerns about side effects are greater in the elderly.

- **Other sedatives**

Gabapentinoids such as gabapentin and pregabalin have sleep-promoting effects but are not commonly used to treat insomnia. Barbiturates, when used once, are not recommended for insomnia due to the risk of addiction and other side effects.[31]

- **alternative medicine**

Herbs such as valerian, chamomile, lavender or cannabis may be used, but there is no clinical evidence that they are effective. Whether acupuncture is useful is unclear.

1.2.10 Prognosis

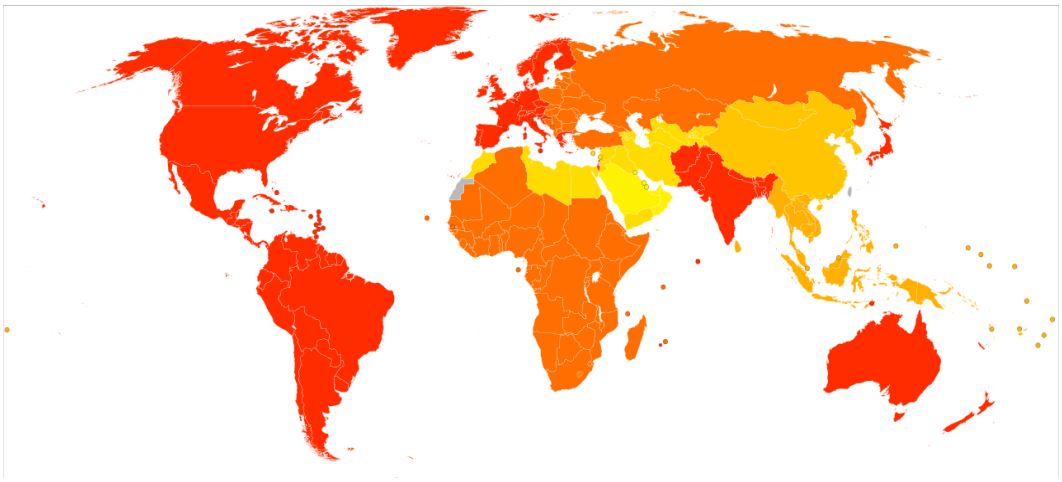


Figure -19

A survey of 1.1 million residents in the United States found that those who slept about 7 hours a night had the lowest mortality rates, while those who slept less than 6 hours or more than 8 hours had the highest mortality rates. Getting 8.5 or more hours of sleep per night is associated with a 15% higher mortality rate. Severe insomnia—less than 3.5 hours of sleep in women and 4.5 hours in men—is associated with a 15% increase in mortality.[33]

With this technique, it is difficult to distinguish between disorders that cause sleep deprivation and premature death caused by sleep deprivation, as opposed to disorders that cause premature death due to lack of sleep.

Much of the increase in mortality from severe insomnia was accounted for after controlling for associated disorders. After controlling for sleep duration and insomnia, sleeping pill use was also found to be associated with increased mortality. The lowest mortality rate was found

in individuals who slept between six and a half and seven and a half hours a night. Even just 4.5 hours of sleep a night is associated with a very small increase in mortality.[34]

Thus, for most people mild to moderate insomnia is associated with increased life expectancy and severe insomnia is associated with very little effect on mortality.

1.2.11 Epidemiology

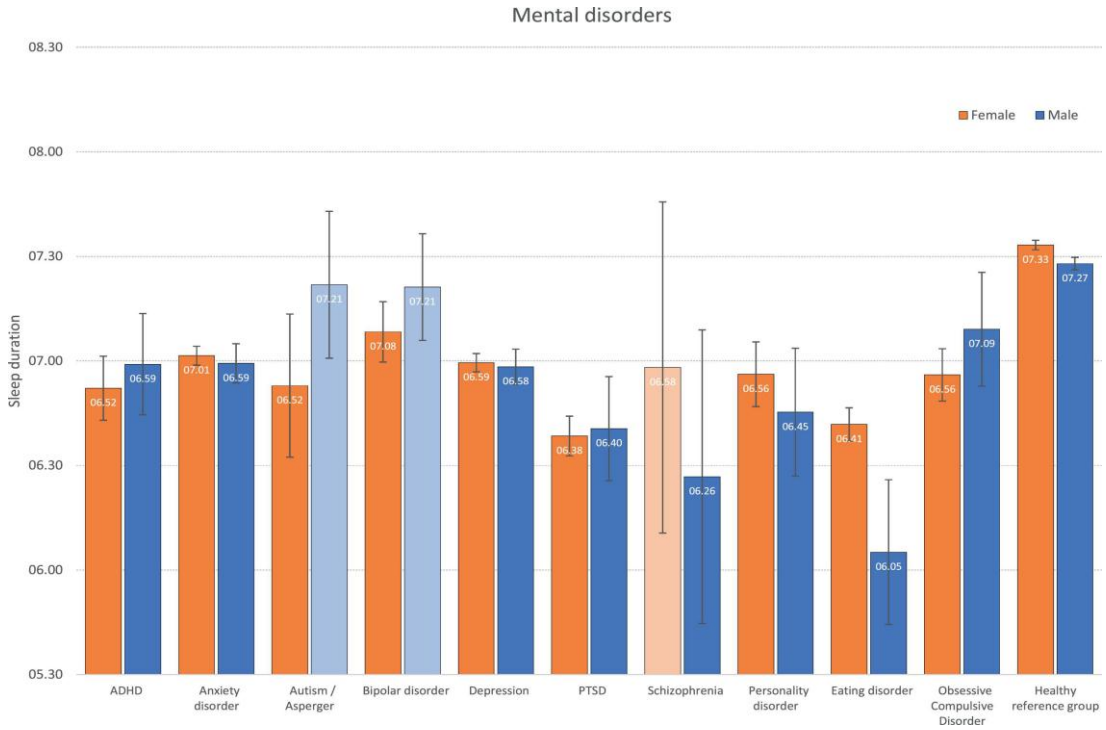


Figure – 20.

Between 10% and 30% of adults have insomnia at any given time and up to half in a year, making it the most common sleep disorder. About 6% of people have insomnia that is not due to another problem and lasts longer than a month. People over the age of 65 are more affected than younger people. Women are more commonly affected than men. Insomnia is 40% more common in women than men.[36] Higher rates of insomnia have been reported in university students compared to the general population.

❖ Society and Culture

The word insomnia comes from the Latin: in + somnus "without sleep" and -ia as a noun suffix. Popular newspapers published stories about people who supposedly never sleep, such as the stories of Thai Ngoc and Al Harpin. Horne writes that "everyone sleeps and needs to," and generally this seems to be true.[38] However, he also relates from contemporary accounts

the case of Paul Kern, who was shot during the war and then "never slept again" until his death in 1943.

1.3. HERBAL AND ALLOPATHIC PRODUCTS USED IN INSOMNIA WITH USES AND INGREDIENTS

1.3.1:-Product name- zandu Bacopa (brahmi)

Figure - 21

ingredient

Each capsule contains bakopa monnieri(L.)Wettst*. Wh. Pi extract 250 mg *Ref: API[40]

uses- can be use in the treatment of anxiety, stress and insomnia.

1.3.2:-product name -mind focus setu

Figure -22.

ingredient- Brahmi ashwagandha Ginkgo biloba, L-Theanine.

uses- in the treatment of cognitive function, attention, memory, reduce stress and insomnia.[41]

1.3.3:-product name - natural sleep aid (Himalayan)

Figure -23

- **product name**- Himalayan organics natural sleep aid

ingredient- melatonin valerian route extract chamomile extracts L-Threonine L-Theanine tryptophan GABA(Gamma aminobutyric acid)[42]

uses- used in the treatment of stress, insomnia, anxiety and sleep disorder.

1.3.4:-product name- smart greens based sleep formula

Figure -24

ingredient- enriched with magnesium Brahmi, ashwagandha, shatavri, sarpgandha[43]

uses- daytime sleepiness, weakness, low sleep quality, insomnia.

1.3.5:-product name- SETU sleep restore strips

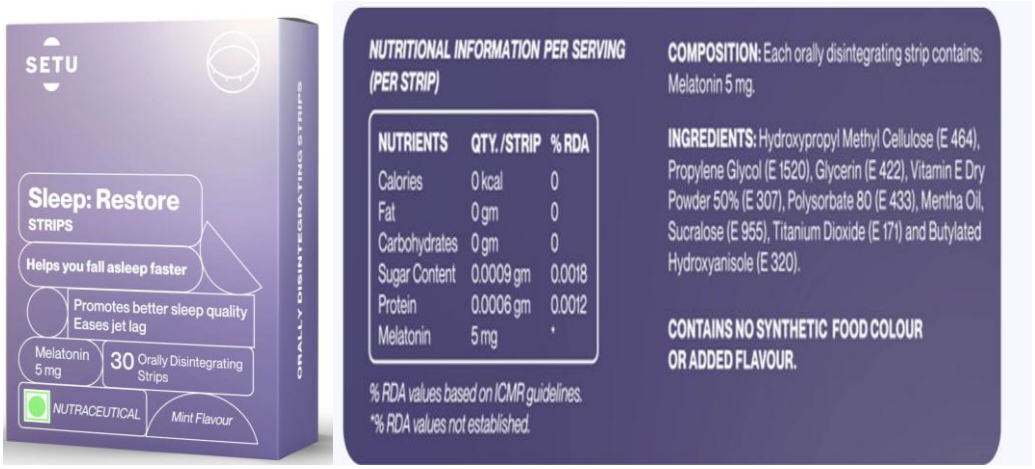


Figure -25

ingredient- hydroxypropyl methyl cellulose(E 464), propylene glycol(E 1520), glycerine, vitamin E dry powder, polysorbate, mentha oil, sucralose, titanium dioxide, butylated hydroxyanisole, melatonin.[44]

uses- in treatment of sleep disorder, low sleep quality, insomnia.

1.3.6:-product name- SETU sleep sustain

Figure – 26

Ingredient- melatonin 10 mg[45]

Uses- to help for a sleep faster and stay a sleep longer.

1.3.7:-product name- kumkaran instant natural sleep

Figure -27

ingredient- melatonin, 5HTP, L Theanine[46]

Other ingredient:- starch, colloidal silicon dioxide, micro crystalline cellulose, talc, magnesium stearate, dicalcium phosphate.

uses- in treatment of insomnia or low quality sleep.

1.3.8:-product name- melatonin

Figure – 28

ingredient - melatonin and melatonin activating medicine[47]

uses- useful in treatment of anxiety stress and sleep disorders(insomnia).

1.3.9:-product name- blissful sleep sleep management by Maharshi Ayurveda

Figure – 29

ingredient- jatamansi,tagara, giloy satva, pipalli, ashwagandha[48]

uses - can be used in the treatment of insomnia.

1.3.10-product name- SUNOVA anti stress

Figure - 30

ingredient- ashwagandha, Brahmi, gotu kola[49]

uses- useful in treatment of stress anxiety and sleep disorder.

Table - 1 - 3.2

Product name-	Ingredients	Uses
zandu Bacopa (brahmi)	Each capsule contains bakopa monnieri(L.)Wettst*. Wh. Pi extract 250 mg *Ref: API	in the treatment of anxiety, stress and insomnia.
mind focus setu	Brahmi ashwagandha Ginkgo biloba, L-Theanine.	in the treatment of cognitive function, attention, memory, reduce stress and insomnia.
natural sleep aid (Himalayan)	melatonin valerian route extract chamomile extracts L-Threonine L-Theanine tryptophan GABA(Gamma aminobutyric acid)	used in the treatment of stress, insomnia, anxiety and sleep disorder.
smart greens plant based sleep formula	enriched with magnesium Brahmi, ashwagandha, shatavri, sarpgandha	daytime sleepiness, weakness, low sleep quality, insomnia.
SETU sleep restore strips	hydroxypropyl methyl cellulose(E 464), propylene glycol(E 1520), glycerine ,vitamin E dry powder, polysorbate, mentha oil ,sucralose, titanium dioxide, butylated hydroxyanisole, melatonin.	treatment of sleep disorder, low sleep quality, insomnia.
SETU sleep sustain	melatonin 10 mg	to help for a sleep faster and stay a sleep longer.
kumkaran instant natural sleep	melatonin, 5HTP, L Theanine Other ingredient :- starch, colloidal silicon dioxide, micro crystalline cellulose, talc, magnesium stearate, dicalcium phosphate	in treatment of insomnia or low quality sleep.
melatonin	melatonin and melatonin activating medicine	Useful in treatment of anxiety stress and sleep disorders (insomnia).
blissful sleep sleep management by Maharshi Ayurveda	jatamansi, tagara, giloy satva, pipalli, ashwagandha	can be used in the treatment of insomnia.
SUNOVA anti stress	ashwagandha, Brahmi, gotu kola	useful in treatment of stress anxiety and sleep disorder.

1.4: HERBAL MEDICINAL PLANTS

1.4.1:- Brahmi

Figure – 31

Figure - 32

Synonyms - Bacopa monniera Hayata & Matsum.

Bramia monnieri (L.) Pennell

Gratiola monnieria L.

Herpestes monnieria (L.) Kunth

Herpestis fauriei H.Lev.

Herpestis monniera

Herpestris monnieria

Lysimachia monnieri L.

Moniera cuneifolia Michx

Kingdom:Plantae

Clade:Tracheophytes

Clade:Angiosperms

Clade:Eudicots

Clade:Asterids

Order:Lamiales

Family:Plantaginaceae

Genus:Bacopa

Species:B. monnieri

Binomial name-:-Bacopa monnieri

Description

Bacopa monieri is a non-scented herb. The leaves of this plant are succulent, oblong and 4–6 mm (0.16–0.24 in) thick. The leaves are pale and arranged oppositely on the stem. The flowers are small, actinomorphic and white, with four to five petals. It can also grow in slightly saline conditions. Propagation is most often achieved by cuttings.[51]

Chemical Constituents of Brahmi

In addition to hersaponin, apigenin, d-mannitol, monirasides I-III, plantenoside B and cucurbitacin; The alkaloids brahmin, herpestine and nicotine have also been classified among the chemical constituents of Bacopa moniera.

uses

Brahmi is used as a general tonic to treat Alzheimer's disease, improve memory, anxiety, attention deficit-hyperactivity disorder (ADHD), allergic conditions, irritable bowel syndrome and combat stress.[52]

Ecology

Bacopa monnieri is one of the most widespread Bacopa species. It commonly grows throughout India, Nepal, Sri Lanka, China, Pakistan, Taiwan, Vietnam, tropical and southern Africa, Madagascar, Australia, the Caribbean, and Central and South America. It is also found in Florida, Louisiana, Texas, and Hawaii.

Phytochemistry

The best-characterized phytochemicals in Bacopa monieri are dammaren-type triterpenoid saponins known as bacosides, which contain jujubogenin or pseudo-jujubogenin moieties as aglycon units. Bacosides comprise a family of 12 known analogues. Other saponins named bacopsides I–XII were identified. The alkaloids brahmin, nicotine, and herpestine have been listed along with d-mannitol, apigenin, hersaponin, monirasides I–III, cucurbitacin, and plantenoside B.[54]

Research and regulation

Bacopa moneri is used in Ayurvedic traditional medicine to improve memory and treat various ailments. A review of early research found that bacopa monieri could improve cognition, although the effect was only measurable after several weeks of use.

In 2019, the FDA issued warning letters to manufacturers of dietary supplements containing bacopa monieri stating that health claims for the treatment or prevention of stomach disorders, Alzheimer's disease, hypoglycemia, blood pressure and anxiety were unsubstantiated and illegal. The FDA stated that Bacopa monnieri products are not approved for these or any medical purposes.[55]

Adverse effects

The most commonly reported adverse effects of Bacopa moneri in humans are nausea, increased bowel motility, and gastrointestinal upset.

- **Brahmi in insomnia problem.**

The use of Brahmi can prove beneficial in the problem of insomnia. By mixing 3 grams of Brahmi powder in half a liter of raw cow's milk and drinking it, you can get rid of chronic insomnia problem. This experiment should be done continuously for a week.[56]

Drinking 100-150 ml of fresh milk with 5-10 ml of fresh brahmi juice is also beneficial in insomnia. If fresh juice is not available then take 5 grams of Brahmi powder.

Brahmi or bacopa is an herb that promotes restful sleep, calms emotional turmoil and also helps increase concentration and alertness. Brahmi, in Ayurveda, is called a brain tonic, and is known to cure digestive problems. It also improves blood circulation, further supporting the body's natural healing process. Because Brahmi has sedative properties; It is advised to use it with caution in combination with other known sedatives.[57]

Massaging the scalp with Brahmi oil helps in relieving sleep disorders which in turn can relieve depression, anxiety and stress. It is recommended that people who are often very negative in life should massage their head with this oil every night. It is also helpful for hyperactive children.

Based on the Bergen Insomnia Scale, bacopa moneri did not improve sleep patterns more than placebo; However, it was associated with greater improvements in emotional well-being, general health, and pain-related symptoms. People usually take about 300 mg per day and it can take about four to six weeks for you to see any results. Studies of Bacopa monnieri also show that it can occasionally cause diarrhea and stomach upset.[58]

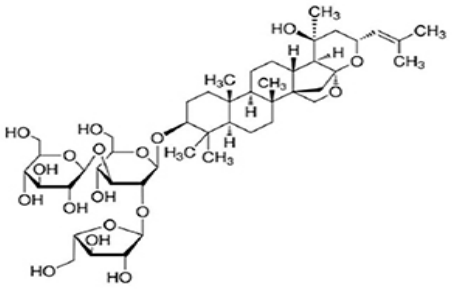
Brahmi helps alter the activity of certain enzymes, which are involved in the stress response. Hence it helps in reducing stress and anxiety. It also boosts your mood, lowering cortisol levels (the stress hormone). It acts as a stressbuster by increasing the level of serotonin in the body.

Brahmi also has anti-epileptic properties as evidenced by reducing dopamine levels of dopaminergic neurons in the frontal cortex region of the rat brain (Jash and Chowdhury, 2014). These observations suggest that Brahmi may have the property to alleviate the positive symptoms of schizophrenia. Brahmi, like most herbs, has an alkaline effect on the body. It is cooling which is why it has a calming effect on pitta dosha and also helps in treating fever and inflammation.[59]

Brahmi contains bacosides A and B, Brahmin as the major alkaloid and another nicotine, herpestine. Bacoside A, B are the main constituents present in Brahmi plant in the form of saponins, D-mannitol, hersaponin and potassium salts are also present.

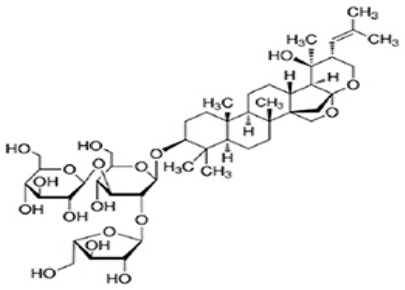
- **Chemical constituents of Brahmi**

In addition to hersaponin, apigenin, d-mannitol, monirasides I-III, plantenoside B and cucurbitacin; The alkaloids brahmin, herpestine and nicotine have also been classified among the chemical constituents of Bacopa moniera.



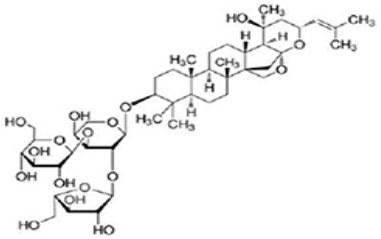
Bacoside A3

(Jujubogenin 3-*O*-[α-L-arabinofuranosyl-(1→2)-*O*-[β-D-glucopyranosyl-(1→3)]-β-D-glucopyranoside])



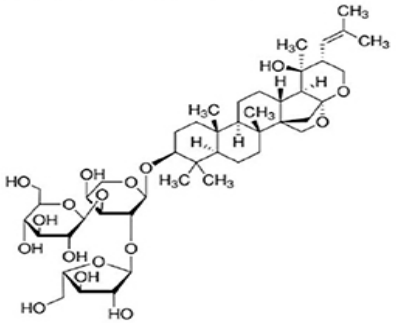
Bacopaside II

(Pseudojujubogenin 3-*O*-[α-L-arabinofuranosyl-(1→2)-[β-D glucopyranosyl-(1→3)]-β-D-glucopyranoside])



Bacopaside X

Jujubogenin 3-O-[β-D-glucopyranosyl-(1→3)-[α-L-arabinofuranosyl-(1→2)]-α-L-arabinopyranoside], Jujubogenin isomer of bacopasaponin C



Bacopasaponin C

Pseudojujubogenin 3-*O*-[β-D-glucopyranosyl-(1→3)-[α-L-arabinofuranosyl-(1→2)]-α-L-arabinopyranoside]

Figure – 33

1.4.2:-Ashwagandha

Figure – 34

Figure – 35

Synonyms

Physalis somnifera L.

Withania kansuensis Kuang & A. M. Lu

Withania microphysalis Suess.

Scientific classification

Kingdom:Plantae

Clade:Tracheophytes

Clade:Angiosperms

Clade:Eudicots

Clade:Asterids

Order:Solanales

Family:Solanaceae

Genus:Withania

Species:W. somnifera

:- binomical name- Withania somnifera

Description

This species is 35-75 cm. (14-30 inches) tall growing small, tender shrub. Tomentose branches extend radially from the central stem. Leaves are pale green, elliptic, usually up to 10–12 cm (3.9–4.7 in) long. The flowers are small, green and bell-shaped. Ripe fruits are orange-red.[60]

Chemical constituents of Ashwagandha

The main components are withanolides – which are triterpene lactones – withaferrin A, alkaloids, steroidal lactones, tropine and cuscohygrin. About 40 withanolides, 12 alkaloids and numerous cytoindosides have been isolated. The withanolides are structurally similar to the ginsenosides of Panax ginseng, which W. The common name for somnifera leads to "Indian ginseng".

uses

Ashwagandha contains chemicals that can help calm the brain, reduce inflammation, lower blood pressure, and modulate the immune system. Since Ashwagandha is traditionally used as an adaptogen, it is used for many stress-related conditions. Adaptogens are believed to help the body resist physical and mental stress.[61]

Ecology

Ashwagandha is grown in sub-marginal waste lands and areas of low fertility. The plant grows well in red, sandy, black and loamy soils with pH 6.5-8.0 with good drainage.

It can be cultivated up to an altitude of 1000 meters. Ashwagandha prefers a sub-tropical climate.

Parts used: Root, leaf and seed

Family: Solanaceae

Ayurvedic Name: Ashwagandha

English Name: Winter Cherry

Phytochemistry - W. Phytochemical analysis of somnifera revealed the presence of pharmacologically active steroidal lactones called withanolides . Withanine, a group of alkaloids isolated from plant roots, constitutes 38% of the total weight of alkaloids.[62]

Research and regulations of Ashwagandha

The available scientific data supports the conclusion that Ashwagandha is a real potent rejuvenating tonic (Ayurvedic chemical) due to its multiple medicinal actions like anti-stress, neuroprotective, anti-tumor, anti-rheumatic, analgesic and anti-inflammatory etc.

It is useful for various types of diseases like Parkinson's, dementia, memory loss, stress induced diseases, melignoma and others.[63]

Ashwagandha is used as a home remedy by Indians, who consider it an excellent tonic for the elderly and children, and an aphrodisiac by the young. It is one of the best nerve tonics in Ayurveda, the oldest system of medical science.

Our clinical experience shows that long-term treatment with Ashwagandha improves neurological conditions causing paralysis and neuronal deficits as well as brain strokes.[64]

Adverse effects

Large doses of ashwagandha can cause stomach upset, diarrhea and vomiting. Rarely, liver problems may occur. When applied to the skin: There isn't enough reliable information to know if ashwagandha is safe or what its side effects might be. Pregnancy: It is unsafe to use ashwagandha while pregnant.

Ashwagandha Root Extract for Insomnia is a natural compound that induces sleep, is well tolerated and improves sleep quality and sleep onset latency in patients with insomnia taking a dose of 300 mg extract twice daily.

- **Ashwagandha as a sleep aid**

Preliminary research has shown that ashwagandha can help people fall asleep faster, sleep longer, and experience better sleep quality10. After taking ashwagandha for six weeks, participants in an actigraphy-based study rated their sleep as 72% better on average 11.[65]

Ashwagandha can also improve sleep quality and help treat insomnia. In particular, the leaves of the plant contain the compound triethylene glycol, which promotes sleep induction.

Both ashwagandha and melatonin have the ability to make you feel sleepy and relaxed. While melatonin can be made naturally in the body, its levels can decrease over time;

Melatonin supplements are a good option when your natural levels of this hormone have declined, which often happens as we age.

But when is the best time of day to take ashwagandha? To see the best results, most studies also recommend taking ashwagandha in the morning. Taking it twice a day can help your body balance your adrenal system. You can buy ashwagandha in capsule form or as a powder to mix with coffee or tea.[67]

Ashwagandha's sedative effects suppress dopamine receptors in the brain as well as stress-induced increases in plasma corticosterone, blood urea nitrogen, and blood lactic acid.

It suppresses the production of a hormone called cortisol in our body. A study published in the Journal of Alternative and Complementary Medicine found that participants who consumed ashwagandha reported a significant improvement in their anxiety or stress levels.

Studies show that ashwagandha lowers cortisol levels in your body, reduces. stress, and improves symptoms such as blood pressure and heart rate. It also helps block nervous system activity associated with conditions such as generalized anxiety disorder, insomnia and clinical depression.[68]

Ashwagandha works to support your body's innate stress management system, ultimately helping to relieve stress and alleviate its negative effects, including feelings of mental fatigue and brain fog.[69]

Aside from diet and exercise, we can increase our serotonin levels with natural, stress-reducing supplements like ashwagandha. When we get our stress levels under control and our moods stabilize, we feel happier, more energized, and better equipped to handle whatever life throws at us. So ultimately it helps with insomnia.

Also shown to improve learning and memory. Ayurvedic practitioners recommend it as a brain booster and forgetfulness remedy.

Best Ashwagandha Extract. When it comes to quality and effectiveness, two branded ashwagandha extracts stand far above the rest: KSM-66 and Sensoril. Both of these are certified, high-potency, full-spectrum, certified organic extracts with a long list of proven health benefits backed by medical studies.

Ashwagandha contains both water-soluble and fat-soluble ingredients, which means you really need to consume both fat and water with the herb to get the full spectrum of benefits.[70]

Drinking water with your ashwagandha supplement is helpful, but your body also needs fat to help it fully absorb.

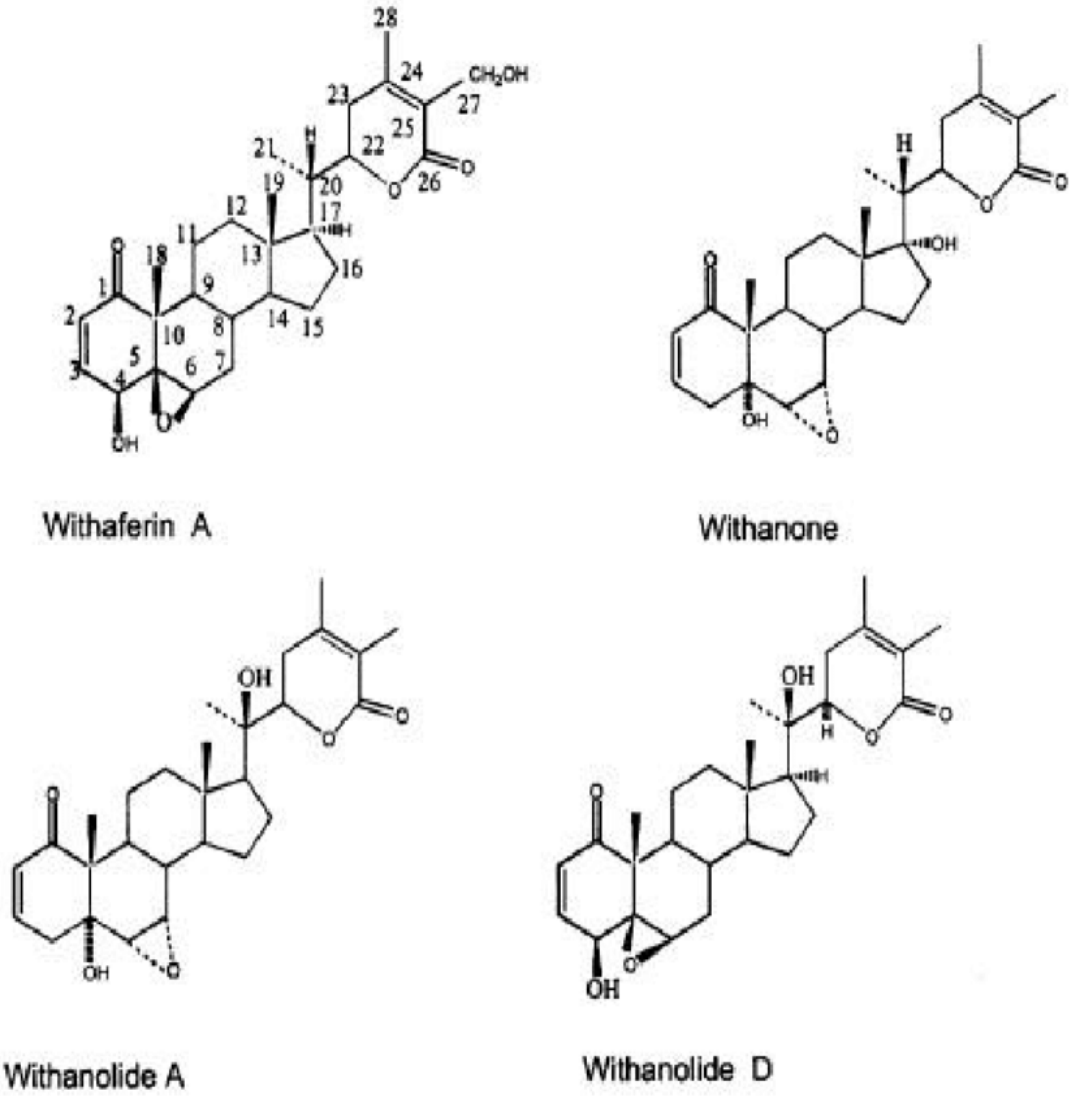


Figure - 36

1.4.3:-Valerian

Figure – 37

Figure – 38

Synonyms

vervain, feverfew, chamomile, echinacea, goldenseal, motherwort, passionflower, scutellaria and Scullcap, Kalanusari, Barhishta, Barhana, Vakra, Shata, Nahusha, Nrupa, Tagara.

Scientific classificationedit

Kingdom:Plantae

Clade:Tracheophytes

Clade:Angiosperms

Clade:Eudicots

Clade:Asterids

Order:Dipsacales

Family:Caprifoliaceae

Genus:Valeriana

Species:V. officinalis

:- Binomial name - Valeriana officinalisL.

Description - Valerian (Valeriana officinalis, Caprifoliaceae) is a perennial flowering plant native to Europe and Asia. In summer when the mature plant is 1.5 m (5 ft) tall, it bears sweetly scented pink or white flowers that attract many fly species, especially hoverflies of the genus Aristalis. It is eaten as food by the larvae of some Lepidoptera (butterflies and moths) species, including the gray pug.

Chemical Constituents

Valerian (Valeriana sp.) contains valeric acids, such as monoterpenes and sesquiterpenes, and iridoid glycosides that give the root sedative and antispasmodic activity. Sesquiterpenes, a constituent of valerian's volatile oil, are believed to be responsible for its biological effects (Houghton 1999).

uses

Valerian has been used medicinally since early Greece and Rome. Historically, valerian was used to treat insomnia, migraines, fatigue, and stomach cramps. Today, valerian is promoted for insomnia, anxiety, depression, premenstrual syndrome (PMS), menopausal symptoms, and headaches.

Ecology

Valerian (Valeriana officinalis) is a plant native to Europe and parts of Asia. Valerian root has a long history of use as a sedative. Valerian can grow just over 6 feet tall and has a strong smell. It acts as a sedative in the brain and nervous system.

Phytochemistry

Wang et al. isolated volvalerin A, a novel N-containing bisequiterpenoid derivative containing a dihydroisoxazole ring and its potential biosynthetic precursor, 1-hydroxy-1,11,11-trimethyldecahydrocyclopropane azuline-10-one from the origin.[43] Han et al. V. officinalis roots isolated valenomerines A-D, two unique neomerene-type sesquiterpenoids and two new nor-sequiterpenoids. Their structures were characterized by extensive spectroscopic analysis and Cu Ka X-ray crystallography. Mirzaei and Dinpanah investigated the utility of hollow fiber-based liquid phase microextraction for the extraction and pre-concentration of valarenic acid previously for its identification by reversed-phase high-

performance liquid chromatography/ultraviolet. Wang et al. Isolated volvalerenone A, V. A new type of mononorcisquiterpenoid with an unprecedented 5/6/6 tricyclic ring system from the root of officinalis. A plausible biosynthetic pathway of volvelarenone A was also proposed.[71]

Valerian's research and rules

The mean study quality was 3.4 (95% confidence interval [CI], 3.0–3.9, 0–5 scale), indicating significant methodological problems in the included studies. There was considerable variation in study design, including variations in valerian preparation and dosing, length of treatment, and outcome assessment (Table 1). Valerian doses ranged from 225 to 1215 mg per day, with the exception of 1 study in which pediatric doses were based on weight.

Adverse Effects of Valerian

Although valerian is considered fairly safe, side effects such as headaches, dizziness, stomach problems, or insomnia may occur. Valerian may not be safe if you are pregnant or breastfeeding. And it has not been evaluated to determine if it is safe for children under 3 years of age.

- **Valerian for Insomnia** – Multiple studies have shown that valerian – a tall, flowering herb – can reduce the time it takes to fall asleep and help you sleep better. Of the many valerian species, only the carefully processed root of Valeriana officinalis has been extensively studied.

Valerian root is known for its sedative effects, which is one reason it is used for insomnia. However, using valerian can cause vivid dreams or even nightmares in some people.

After analyzing 60 research studies published over nearly 40 years, researchers determined that valerian root could possibly improve sleep and reduce anxiety in many people. Valerian root supplements have been found to help people fall asleep faster, improve their sleep quality, and spend more time in deep sleep stages.[72]

Recommended dosage of valerian root for sleep

Based on available research, take 300 to 600 milligrams (mg) of valerian root 30 minutes to two hours before bedtime. This is best for insomnia or trouble sleeping.

Although valerian is considered fairly safe, side effects such as headaches, dizziness, stomach problems, or insomnia may occur. Valerian may not be safe if you are pregnant or breastfeeding. And it has not been evaluated to determine if it is safe for children under 3 years of age.

It adjusts your circadian rhythm, which is your body's "clock." Valerian root is a milder alternative and doesn't affect sleep as much as it affects stress levels. It has fewer side effects but can still cause dizziness or slight drowsiness. Melatonin is a strong choice between the two.

Valerian has been used safely in doses of 300-600 mg daily for up to 6 weeks. The safety of long-term use is unknown. Valerian is generally well tolerated. Some common side effects include dizziness, drowsiness, headache, stomach upset, mental retardation and vivid dreams.

Who should not take Valerian?

People with liver disease.

Women who are pregnant or breastfeeding.

Children under 3 years of age (1,3)

Neither is a substitute for medical treatment, and there is little research on the effects of long-term use. Melatonin can help with jet lag, helping your brain adjust to the new time zone. Valerian root has been shown to reduce sleep latency and help you fall asleep faster.

How fast does valerian work?

Adult For insomnia, valerian can be taken 1 to 2 hours before bedtime or up to 3 times a day, with the last dose close to bedtime. It may take a few weeks before the effects are felt.

Hepatotoxicity. Valerian has been implicated in small cases of clinically apparent liver injury, but usually in combination with other botanicals such as skullcap or black cohosh. Considering its widespread use, valerian is considered a very rare cause of liver injury. Valerian may have a sedative effect. It can have a stimulating effect for extreme fatigue. Valerian root can lower blood pressure and relax muscles.

In other words, it inhibits nerve transmission, which contributes to a calming effect on the body. Some research suggests that valerian root has mild sedative and calming properties—less so than prescription sleeping pills. Other studies suggest that valerian root may be helpful for anxiety.

Valerian is effective in treating anxiety and depression in menopausal women. Valerian is a safe herbal remedy in HD. Valerian has also shown effectiveness with little or no adverse effects when used properly and following expert recommendations.

How much valerian a person should take varies, but bedtime doses usually range from 400-900 milligrams (mg). Dosage also depends on how much valerenic acid is in the supplement. Valerian acid is considered one of the most powerful sedative components of valerian.

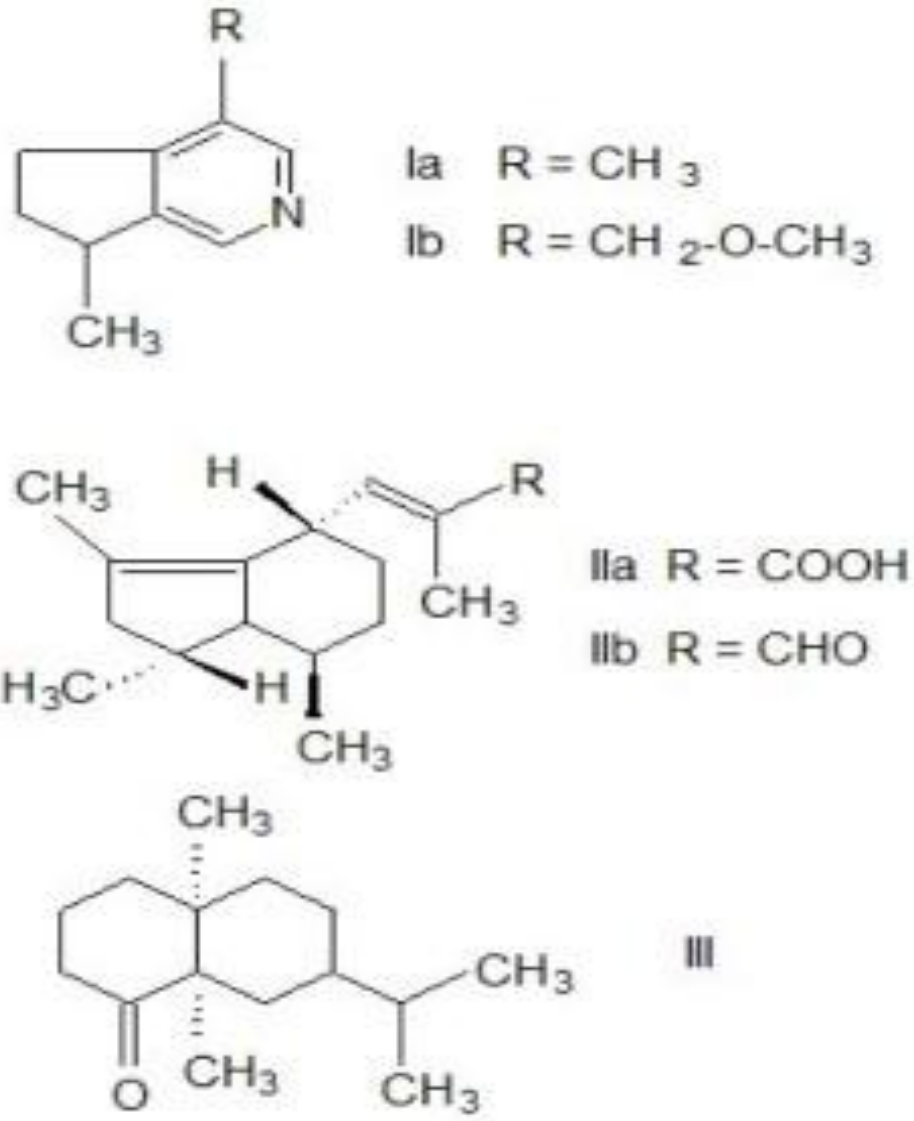


Figure - 39

1.4.4:- Lemon balm

Figure – 40

Figure – 41

Synonyms -balm, garden balm, sweet balm, bee-balm, beebalm and Melissa officinalis, phudina.

Scientific classification

Kingdom:Plantae

Clade:Tracheophytes

Clade:Angiosperms

Clade:Eudicots

Clade:Asterids

Order:Lamiales

Family:Lamiaceae

Genus:Melissa

Species:M. officinalis

Binomial name - Melissa officinalisL.

Description- Lemon balm (Melissa officinalis) is a perennial herbaceous plant in the mint family Lamiaceae,[1] and is native to south-central Europe, the Mediterranean basin, Iran and Central Asia, but is now naturalized in the Americas and elsewhere. Another name, officinalis (Latin, 'of the shop'), derives from the herb's use by apothecaries, who sold herbal remedies directly to their customers.[74]

Lemon balm plants grow bushy and upright to a maximum height of 100 cm (39 in). The heart-shaped leaves are 2–8 centimeters (0.79–3.15 in) long and have a rough surface. They are soft and fluffy with scalloped edges, and have a mild lemon scent. During summer, small

white or pale pink flowers appear. The plant lives ten years; Crop plants are replaced after five years to rejuvenate the soil.

Chemical constituents of lemon balm- Lemon balm extract: flavonoids with hydroxycinnamic acid derivatives and caffeic acid, m-coumaric acid, eriodictyol-7-o-glucoside, naringin, hesperidin, rosmarinic acid, naringenin, hesperidin, hesperin, hesperin. Extract (gallic acid equivalent).

Uses- Lemon balm (Melissa officinalis), a member of the mint family, is considered a soothing herb. In the Middle Ages it was used to reduce stress and anxiety, promote sleep, improve appetite, and ease pain and discomfort from indigestion (including gas and bloating, as well as colic).

Ecology - Lemon Balm is a herbaceous perennial that grows well in partial shade as well as full sun. It is considered a great companion plant by organic gardeners and is known to attract wildlife to the garden.

Phytochemistry of lemon balm- Chemical compositions of Melissa officinalis L. Dried lemon balm leaves: citral (neral + geranial) 0.13%, total polyphenol compounds 11.8% including total hydroxycinnamic compounds 11.3% (rosmarinic acid 4.1%) and total compounds. 0.5% flavonoid.

Research and Regulation of Lemon Ointment Some studies show that lemon balm, combined with other calming herbs (such as valerian, hops, and chamomile), helps reduce anxiety and promote sleep. Aside from topical use, few studies have examined lemon balm by itself. For example, in one study of people with mild sleep problems, 81% of those who took an herbal mixture of valerian and lemon balm reported better sleep than those who took a placebo. It is not clear from this and other studies whether lemon balm or valerian (or a combination) is responsible for the results. The same is true of many studies for anxiety, in which herbal combinations were used to reduce symptoms.

Adverse Effects – Side effects are usually mild and may include increased appetite, nausea, dizziness, and wheezing. There is not enough reliable information to know if lemon balm is safe to use for longer than 6 months. When applied to the skin: Lemon balm is probably safe for most adults. It can cause skin irritation.

- **Lemon Balm is used in Insomnia**

Insomnia and anxiety

Some studies show that lemon balm, combined with other calming herbs (such as valerian, hops, and chamomile), helps reduce anxiety and promote sleep. Aside from topical use, few studies have examined lemon balm by itself.

How do you use lemon balm for anxiety?

One of the easiest ways to get your daily dose of lemon balm is to make it into a tea! The ratio is easy to remember: 1 teaspoon dried or chopped fresh lemon balm per eight fluid ounces. Let the tea steep for at least eight minutes for best results.

Based on meta-analysis results, lemon balm significantly improved mean anxiety and depression scores compared to placebo (SMD: -0.98; 95% CI: -1.63 to -0.33; p = 0.003), (SMD: -0.47; 95% CI). doing. : -0.73 to -0.21; p = 0.0005) respectively, without serious side effects.

Lemon balm can help reduce anxiety symptoms by elevating mood and reducing levels of stress hormones. Additionally, lemon balm has been shown to improve cognitive function and reduce feelings of stress and tension. Lemon Balm Suggested uses include abdominal cramps, flatulence, Graves' disease, herpes labialis (topical), insomnia, antispasmodic, appetite stimulant, and as a digestive aid.

A combination of lemon balm with valerian can help relieve restlessness and sleep disorders such as insomnia. In a 2006 study, researchers found that children who took the combined dose had a 70 to 80 percent improvement in symptoms.

Lemon balm significantly reduces excitatory transmission in the brain by inhibiting an enzyme called GABA-T that breaks down GABA, thus increasing the amount of GABA available in the brain.

Lemon balm and its main ingredient, rosmarinic acid (RA), effectively ameliorate liver injury and obesity; However, their therapeutic effects on non-alcoholic steatohepatitis (NASH) are unknown.

Lemon balm can lower your blood pressure and therefore should be used with caution if you are taking medications with similar properties. It can also lower your blood sugar levels and people with diabetes should use lemon balm with care.

The tea has historically been used to treat digestive disorders and relieve pain, including menstrual cramps and headaches. Lemon balm tea also has a mild calming effect, making this drink a good choice for those who suffer from sleep disorders or are looking for a bedtime tea.

In vitro studies have shown that extracts from armpitweed and lemon balm stimulate thyroid hormone production through both TSH and Graves' antibodies. It is considered 100% caffeine free. That is, it does not contain caffeine.

Scientifically known as Melissa officinalis, it has soothing, diuretic and expectorant properties. So when taken with lemon it can be used as a home remedy to relax, relieve fluid retention and reduce mucus production. It contains a compound called rosmarinic acid which has antioxidant and antimicrobial properties.

Lemon balm tea works to reduce the stress hormone cortisol and does not cause drowsiness. It can also increase alertness and concentration. Of all the herbal varieties, it's a great choice if you need a mid-day reset (without caffeine).[75]

Lemon balm extract: caffeic acid, m-coumaric acid, eriodictyol-7-o-glucoside, naringin, hesperidin, rosmarinic acid, naringenin, hesparatin, phenolic content of extract (gallic acid) with hydroxycinnamic acid derivatives and flavonoids. It is known for its anti-anxiety and calming effects, improving focus, memory and cognition, and reducing irritability and depression.If you are using L-Theanine to help you relax at night, it is best to take the supplement between 30 minutes and an hour before your bedtime. This gives your mind compound time to calm down and relax before you start trying to fall asleep.

Consumption of lemon balm leaf powder significantly reduced LDL and liver enzyme AST compared to placebo treatment. Such results suggest that lemon balm supplementation is both safe and effective for patients with mild hyperlipidemia. So ultimately it helps with insomnia and promotes sleep.

Lemon balm extract: caffeic acid, m-coumaric acid, eriodictyol-7-o-glucoside, naringin, hesperidin, rosmarinic acid, naringenin, hesparatin, phenolic content of extract (gallic acid) with hydroxycinnamic acid derivatives and flavonoids.

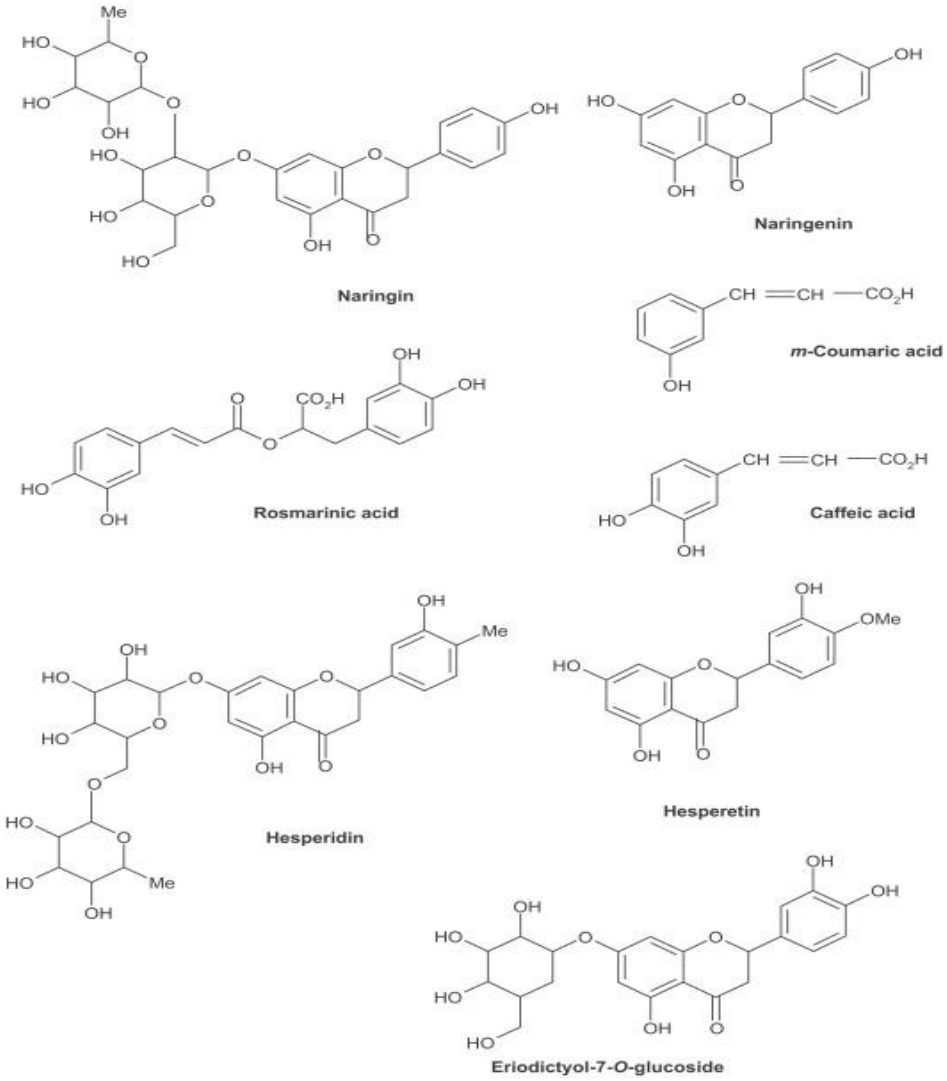


Figure - 42

1.4.5:- Kava (Piper methysticum)

Figure – 43

Figure – 44

Binomial name - Piper methysticum G. Forst.

Synonyms - kavakava, sarsaparilla, yohimbe and iboga, Sevan

Scientific classificationedit

Kingdom:Plantae

Clade:Tracheophytes

Clade:Angiosperms

Clade:Magnoliids

Order:Piperales

Family:Piperaceae

Genus:Piper

Species:P. methysticum

Description - Kava is a tall shrub that grows in the islands of the Pacific Ocean. This shrub produces large, green, heart-shaped leaves that grow thickly on the branches. Long, slender flowers grow where the branches meet the stem. Roots look like bundles of woody, hairy branches. Kava or kava kava (Piper methysticum: Latin 'pepper' and Latinized Greek 'intoxication') is a crop of the Pacific Islands.[1] The name kava comes from Tongan and Markesan, meaning 'bitter';[1] other names for kava include ‘Awa (Hawaii),[2] ‘Awa (Samoa),[3] Yakona or Yagona (Fiji),[4] Sakau (Pohnpei),[5] Seka (Kosara),[6] and Malok or Malogu (parts of Vanuatu).

Kava is consumed for its sedative effects throughout the Pacific Ocean cultures of Polynesia, including Hawaii, Vanuatu, Melanesia, and parts of Micronesia.[76]

Chemical constituents of kava - eighteen kava lactones, cinnamic acid bornyl ester and 5,7-dimethoxy-flavanone, known to be present in kava root, and seven compounds, including 2,5,8-trimethyl-1-. Naphthol, 5-methyl-1-phenylhexane-3-yn-5-ol, 8,11-octadecaedinoic acid-methyl ester, 5,7-(OH)(2)-4'-one-6,8-dimethylflavanone, Pinostrobin.

Uses of Kava - Kava Kava ("Kava" for short) contains substances called kavapyrans. They act on your brain like alcohol, making you feel calm, relaxed and happy. The plant is also believed to relieve pain, prevent seizures, and relax muscles.

Ecology of Kava

Kava is an evergreen shrub that thrives in well-drained soil and grows well as an understory crop (that is, too much sunlight, especially in early growth, is detrimental). It grows naturally where there is more than 2,000 millimeters of rain or close to 80-inches per year

Phytochemistry of Kava - Kava also contains other non-lactone compounds, namely, flavocavannes A, B, and C, 5,7-dimethoxyflavanone, cinnamic acid bornyl ester, flavanones, fatty acids, and a chalcone.

Kava effects may be the result of the synergy of the six main kavalactones.

Research and Rules of Kava

Kava is under preliminary research for its potential psychoactive[33]—primarily anxiolytic—sleep-enhancing and sleep-enhancing properties.[89] An early randomized controlled trial in anxiety disorders indicated higher rates of improvement in anxiety symptoms after kava treatment compared to placebo.

Kava remains legal in most countries. Regulations often treat it as a food or dietary supplement.

Adverse Effects of Kava

Side effects of kava include.

Allergic skin reactions, dizziness, drowsiness, large number of pupils, gastrointestinal upset, headache, hepatitis (acute), liver damage.

Kava is considered a safe and non-hazardous herbal medicine, although it can cause side effects in high doses.

Use of Kava in Insomnia

Kava is commonly used as an alternative to these sleep medications because of its calming effect. In one study on 24 people, kava was found to reduce stress and insomnia compared to a placebo. However, both the researchers and the participants knew whether they were receiving kava or a placebo.

- **Kava as a sleep aid**

Kava is commonly used as an alternative to these sleep medications because of its calming effect. In one study on 24 people, kava was found to reduce stress and insomnia compared to a placebo. However, both the researchers and the participants knew whether they were receiving kava or a placebo.

Take kava in tea, powder, capsule, or tincture form. Experts recommend a daily dose of 70-250mg of kavalactones. Read the product label to find the kavalactone content.

For better sleep, take kava an hour before bed.

Kava can help with sleep by calming the mind and reducing stress. Kava induces a feeling of relaxation that can help you sleep better. It can be effective for anxiety and does not have the side effects of prescription drugs.

Throughout the South Pacific Islands this tea is often consumed socially and as part of traditional ceremonies and cultural practices. In small doses, kava's effects include muscle relaxation, sleep, and a feeling of well-being.

When taken for sleep problems, kava promotes deep sleep without affecting restful REM sleep. Kava can be used instead of prescription anti-anxiety medications such as benzodiazepines and tricyclic antidepressants.

Using melatonin with kava may increase side effects such as dizziness, drowsiness, confusion, and difficulty concentrating. Some people, especially the elderly, may experience impairment in thinking, judgment and motor coordination.

Kava is known for its mind and body relaxing properties, making it an ideal all-natural sleep aid for those who have trouble falling or staying asleep. Heavy kava is a sleeping kava as it is best suited for nighttime consumption.

What does kava do to the brain?

Kava essentially acts as a central nervous system depressant because it affects receptors for the neurotransmitter gamma-aminobutyric acid (GABA) and stimulates dopamine in the brain. The calming and mood-boosting effects that the substance induces may lead some people to abuse kava to intensify these feelings.

The increase in GABA activity may also be secondary to suppression of thromboxane by caffeine, which further increases GABA activity. In addition, kavalactones block calcium channels, and various kavalactones can thus add up, reducing calcium influx by as much as 70 percent.

Long-term use of kava can cause side effects including weight loss, facial swelling, blood in the urine (hematuria), kava dermopathy, lymphocytopenia, movement disorders, decreased protein levels, pulmonary hypertension, rash, increased red blood cell count, and thrombocytopenia.[77]

Kava can interact with many medications, including medications used for Parkinson's disease and benzodiazepines used for anxiety. Alcohol or acetaminophen (Tylenol), which can cause liver damage, should never be used with kava.

Cholesterol was significantly higher for current kava users: 28% were greater than 5.5 mmol/L compared with 11% for recent users and 11% for non-users.

The mild euphoria comes from desmethoxyyangonin, another major kavalactone that increases dopamine levels. "Because of this, when you drink kava, your perception of reality doesn't change," Labot tells Rolling Stone. "It doesn't directly affect the central nervous system."

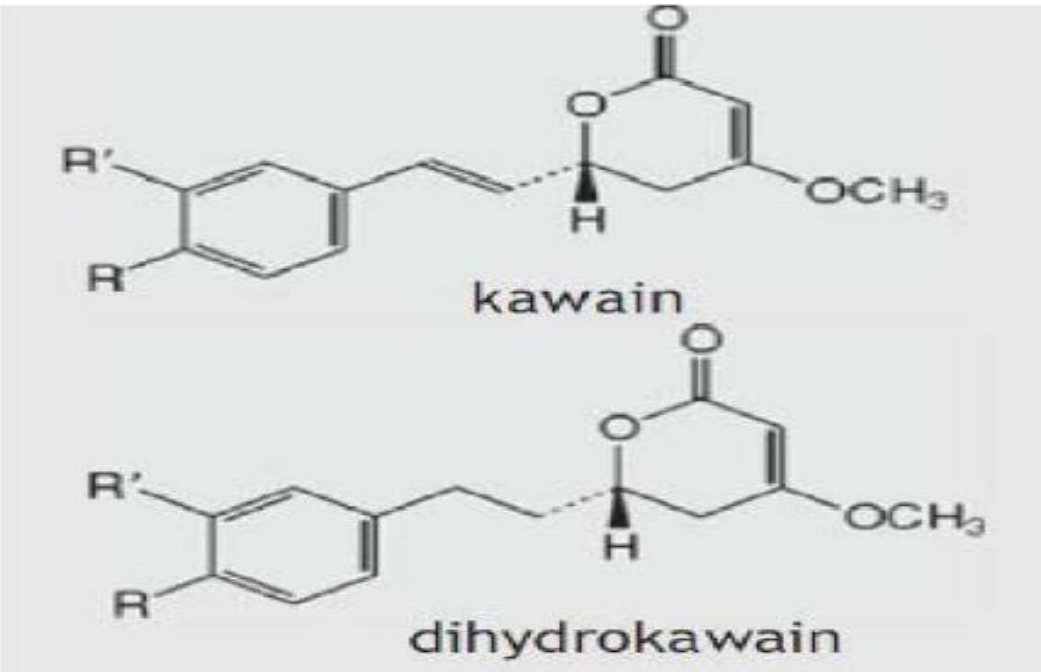


Figure - 45

★ CONCLUSIONS

- This review found a large number of trials and low to moderate strength evidence supporting several interventions for insomnia disorders.
- This results are consistent with and robust to previous reviews concluding the efficacy of CBT-I in both general adult populations and older adult populations.
- No other psychological interventions have evidence of efficacy in outcomes, largely due to a lack of a sufficient number of trials examining similar comparisons.
- In older adults, there is evidence of the effectiveness of multicomponent behavioral therapy as well as CBT-I across a range of sleep outcomes.
- Evidence shows the effectiveness of nonbenzodiazapine hypnotics for the treatment of insomnia disorders in the general adult population and in older adults.
- Overall, many options exist for treating insomnia in adults and in older adults. Psychological approaches may be more sustainable and less likely to cause harm.
- Treatment results in global improvement as well as improved sleep in insomnia sufferers.

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