

Evaluation and Formulation of Ayurvedic Tonic for Mental Wellness in Teenagers.

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INTRODUCTION

Mental health refers to a person's emotional, cerebral and social well-being. It affects how individualities suppose, feel, bear, and influences how they manage with stress, relate to others, and make choices. Mental health conditions are important at every stage of life, from youth through majority. Mental health conditions, analogous as depression, anxiety, and schizophrenia can disrupt a person's well-being and their day-to-day functioning. Mental health conditions are told by a variety of factors, analogous as genetics, surroundings, life experience, and physical health. Taking care of internal health involves factors analogous as seeking help and support when demanded, exercising tone-care, maintaining social connections and taking part in various exertion that promote well-being. Good Mental Health means * Feeling suitable to manage with the normal stresses of life. *

Having a sense of purpose and fulfilling. * Been suitable to acclimate change and handle adversity Mental complaint (e.g. anxiety complaint) and sedentary conduct are adding generally among overgrown-ups and children. One particular targeted group that has arising cases presently are teenagers that mainly include council and university going scholars. In particular, anxiety and depressive symptoms as well as stress symptoms are actually common. Mental condition analogous as depression (major depressive condition, MDD) and non-transmissible conditions (NCDs), ultimate of them life related conditions (LSRD), are getting the major causes of poor health. According to the World Health Organization (WHO) the frequency of internal conditions has increased dramatically in recent times, indeed in on-industrialized countries. present, trouble of cerebral conditions, depression (MDD) in particular, no longer confined to certain vulnerable population groups. Mental conditions constitute a public health burden and a major cause of premature mortality and disability among all age groups and societies. astronomically it's estimated that one in seven (14) of 10-19 times experience internal health conditions. This condition accounts for 15 of global burden of conditions in this age group. In India, studies have indicated a significant frequency of internal health issues among adolescents, with rates varying depending on conditions that are specific and population studies

. Common Mental Health conditions in Teenagers

- * Depression
- * ADHD (Attention insufficiency/ hyperactive condition)
- * Eating complaint
- * PTSD (Post Traumatic Stress condition)
- * Anxiety condition

Teenage is a special and vital period of life. Teenagers might grow sensitive to intellectual stress as a result of material, internal, and social aspects, analogous as loss, mistreatment, or violence. Teenage health and wellbeing

largely depend on safe guarding them from stress, supporting social and emotional development and internal well-being, or rather guaranteeing vacuity to health care treatment. Teenagers with internal health illness are more susceptible to social solitude, reduction which influences their goodwill to seek support, educational challenges, trouble-taking exertion, physical illness and abuses of mortal rights. The study revealed that, of the 230 academe adolescents, 52.2 had CMD indicating the significant vulnerability to internal torment in this population. The report of the World Health Organization revealed similar data, which predicated on the analysis of frequency of conditions in children and adolescents in countries analogous as Germany, Spain, Ethiopia, the United States, India, Japan and Switzerland, directed out rates around 50. The reason we targeted out teenager group is to make the root strong and help teenagers to deal with stress and other internal causes that primarily occurs in teenage and adolescents. Ayurveda follows the essential principle of five great rudiments, which insists that the fault, the purity should be in perfect harmony with all five rudiments used to form the mortal body, i.e. earth (Prithvi), fire (Agni), water (Jal) and space (Akash). According to this, there should be a balance in the three essential powers, Vata (air space = wind), Pitta (fire water = cattiness) and Kapha (water earth = impassiveness). Ayurveda explains that, when these three powers are in a balanced state or live in equal proportion, the body will remain healthy differently it becomes unhealthy in multitudinous ways. Ayurveda is mainly connected with the cures accessible from nature and deals with the root cause of the complaint and provides endless cure is utmost of cases. generally, a case treated with Ayurvedic medicines, not only gets cured but also achieves the endless impunity. It's therefore well accepted that the Ayurveda not only treats a case with internal conditions, but also increases the overall internal capability by strengthening the impunity, thus keeping the mind and the body free from further damages. The consumption of the prescribes Ayurvedic medicines, enhance the attention and other internal capabilities. Popularly the extracts of Bacopa Monnier (Brahmi), Acorus calamus (Vach), Celastrus paniculatus (Jyotis Mati) are considered extremely salutary in strengthening internal conditions. Ayurvedic medicines for ADHD is made from natural seasoning that cure internal disabilities, for illustration, Centola asiatica (Mansukhani), Bacopa Monnier (Brahmi), With Ania somniferous(ashwagandha), Celastrus paniculatus (Jyoti Mati) etc. The bipolar complaint results in an unusual shift in mood, and conditioning affecting the internal capability of a person to carry out regular day to day exertion. To cure this, Brahmi passion flower and several other Ayurvedic gravies are fairly.

MATERIALS AND METHODS PLANT DESCRIPTION

1. BRAHMI (BACOPA MONNIERI)

Brahmi (Bacopa Monnier) is a deified medicinal condiment in Ayurvedic and traditional systems of drug, known for its important goods on the brain and nervous system. One of its uses most honoured is its capability to ameliorate cognitive functions similar as memory, literacy, and attention.

It's frequently used by scholars and grown-ups to enhance internal clarity and focus. Brahmi is believed to stimulate brain chemicals that are involved in thinking, literacy, and memory. It's also known for its adaptogenic parcels, which means it helps the body acclimatize to stress and promotes a sense of calmness without causing doiness. Regular consumption of Brahmi may reduce anxiety, internal fatigue, and symptoms of depression.



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2. **ASHWAGANDHA (WITHANIA**

SOMNIFERA) Ashwagandha also known as With Ania somniferous, is an evergreen shrub cultivated in tropical and tropical areas of Asia, Africa, and Europe. It's generally called by the Sanskrit name, Ashwagandha, because the factory's roots are said to smell like a wet steed ("Ashwa" for steed and "Gandha" for smell). Ashwagandha is also occasionally known as downtime cherry or Indian ginseng, although it does not belong to the ginseng family.

Ashwagandha root has been used in the traditional Ayurvedic and Unani drug systems of India as an adaptogen, which is approximately defined as an emulsion or product that increases the capability of a person to repel, acclimatize, or come flexible in nonspecific ways to natural, physical, or chemical stress.

The species name somniferous comes from the Latin word for sleep- converting, signifying another purported property of this botanical. In addition to sleep, ashwagandha is generally promoted for stress and anxiety reduction. Ashwagandha is rich in phytochemicals, including steroidal lactones (known as with anilids) and alkaloids. While with anilids are believed to be responsible for numerous of ashwagandha's proposed goods, substantiation from preclinical studies suggests that other, non- with anilid factors may also be involved. One of the most notable benefits of ashwagandha is its eventuality to enhance brain health. It has long been regarded as an adaptogen, which means it helps the body acclimatize to stress by regulating colourful physiological processes. The condiment has a profound impact on the brain by reducing cortisol situations, the primary stress hormone that can significantly affect cognitive function. By dwindling cortisol, ashwagandha can help to alleviate the goods of habitual stress, which is known to vitiate memory, focus, and decision- making capacities. also, exploration has indicated that ashwagandha may enhance memory retention and ameliorate cognitive performance, especially under conditions of high internal strain. Studies have also shown that the condiment might play a defensive part against neurodegenerative conditions.

3. SHANKHPUSHPI (CONCOLVULUS PROSTRATUS)



Convolvulus prostrates (*Convolvulus pluralism*) is a condiment found in India and Burma that's used in Ayurveda. In Ayurveda is known as shankhpushpi

and the medication shankhpushpi is, according to utmost sources, identical with *Convolvulus prostrates*, but some say shankhpushpi is rather *Clitoris tern tea*. Some also say Shankhpushpi is

Volvulus halcinonides, which is another factory of the same family. It has been used traditionally as a brain alcohol and is believed to help aimed to have demonstrated implicit for anxiolytic, relaxant, andante-obsessive goods, as well as nootropic goods. Shankhpushpi has been found to help

significantly with memory retention. In cholesterol- fed gerbils Shankhpushpi was observed to have significantly helped reduce serum cholesterol, low viscosity lipoprotein cholesterol, and triglycerides after ninety days. Shankhpushpi also demonstrated a thyroid suppressing effect when administered (at 0.4 mg/ kg) to mice with hyperthyroidism. It has been studied for use as anticonvulsant with mixed results.

Shankhpushpi is one of the most famed Ayurvedic sauces for promoting brain health and overall internal heartiness. It's traditionally regarded as an important Medhya Ras Ayana (brain rejuvenator) that enhances memory retention, sharpens intellect, and improves learning capacities. Regular use of Shankhpushpi is believed to strengthen the nervous system and support better collaboration between the brain and body. Its adaptogenic and nootropic parcels make it an ideal condiment for scholars, professionals, and individualities passing internal prostration or performance pressure. By acting as a natural anxiolytic, it helps reduce stress, nervous pressure, and emotional insecurity. also, it has mild dreamy goods that promote peaceful sleep, making it useful in managing wakefulness without causing reliance. Shankhpushpi is also known to support clarity of study, internal alertness, and emotional adaptability. It's frequently specified as a natural remedy for anxiety diseases, fear attacks, attention deficiency, and mild to moderate depression due to its comforting and invigorating goods on the brain. Beyond its brain-boosting parcels, Shankhpushpi has a wide range of fresh remedial uses.

4. MORINGA (MORINGA OLEIFERA)

Moringa, scientifically known as *Moringa oleifera*, is a largely valued plant native to the Indian key and now cultivated in various parts of Asia, Africa, and South America. Generally known as the "drumstick tree," "phenomenon tree," or "horseradish tree," Moringa is celebrated for its exceptional nutritive, medicinal, and environmental benefits. nearly every part of the tree — including its leaves, capsules, seeds, flowers, dinghy, and roots is comestible and used in traditional systems of drug similar as Ayurveda and Unani. Moringa is a hustler of nutrients, rich in essential vitamins like A, C, and E, minerals similar as calcium, iron, magnesium, and potassium, and contains all nine essential amino acids. It also has strong antioxidant, anti-inflammatory, and antimicrobial properties. Due to its emotional nutrient content, it's extensively used to combat malnutrition, especially in developing regions. Moringa supports vulnerable health, promotes healthy digestion, helps regulate blood sugar and cholesterol situations, and is also believed to protect against colourful habitual conditions. Its wide range of remedial operations has made it a popular superfood in ultramodern natural health and heartiness practices.



Moringa oleifera, frequently appertained to as the “phenomenon tree,” offers multitudinous implicit benefits for brain health and cognitive function. Rich in antioxidants similar as quercetin and vitamins like A, C, and E, Moringa helps cover brain cells from oxidative stress, which is frequently linked to neurodegenerative diseases. It's known to support internal clarity, ameliorate focus, and enhance overall cognitive performance. Its neuroprotective parcels make it salutary in precluding memory loss and managing conditions similar as Alzheimer's complaint. The presence of essential amino acids and iron also contributes to better oxygen force to the brain, thereby perfecting internal alertness and reducing fatigue. likewise, Moringa may help regulate mood and combat symptoms of anxiety and depression by balancing neurotransmitters and reducing inflammation in the brain.

Beyond brain health, Moringa provides a wide range of remedial and nutritive benefits. It supports the vulnerable system due to its high content of vitamins, minerals, and phytonutrients. Moringa is extensively used to manage blood sugar situations and may be helpful for people with diabetes.

Plant materials:

The plant of moringa, shankhpushpi, Tulsi and amla was obtained from local area in navy Mumbai and powder of Brahmi were purchased from local ayurvedic shop and ashwagandha was obtained from college itself.

Reagents and chemicals:

The chemical and solvents used in this includes distilled water, preservative like citric acid were obtained from the laboratory of Chhatrapati Shivaji Maharaj university, panel, Maharashtra, India.

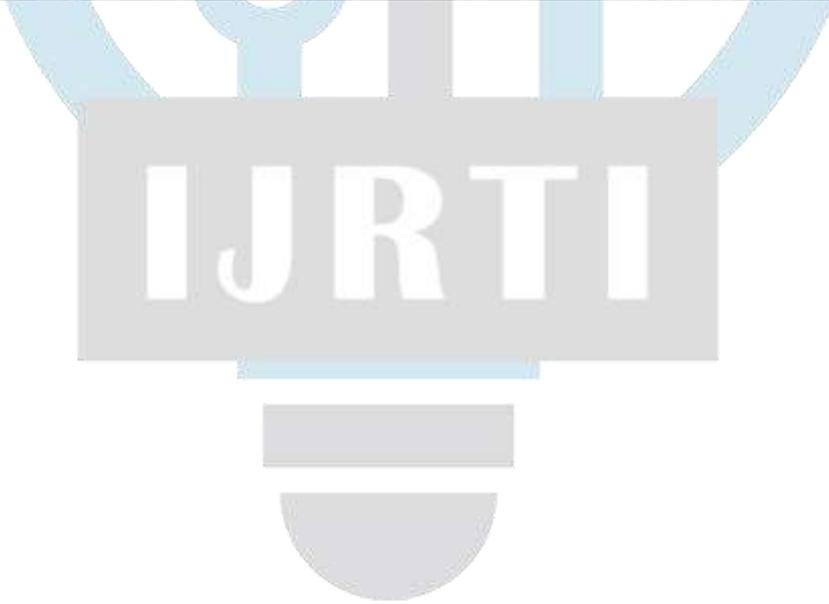
Extraction procedure:

Decoction method:

To prepare the decoction of the herbs, all the herbs were taken and converted into powder form. Later the powder was taken individually and decoction were made. To make decoction we took the measured amount of herb and added distilled water to it and boiled for 10-15 minutes on water bath.

The extraction process was carried out at the temperature range of 70–80 °C to ensure the optimal extraction.

The decoction of all the herbs were prepared by the same process individually. The resulting extracts were then prepared for further analysis and tests.







EXTRACTS OF HERBS

Phytochemical test summary:

Qualitative assays were performed based on the standard pharmacy protocol. Qualitative phytochemical results.

phytochemical	Test	result
Alkaloids	Positive (Reindorf's & Mayer's tests)	pass
Saponins	Moderate foam observed	pass
Flavonoids	Positive (Shinoda & Alkaline reagent tests)	pass
Tannins	Green-black coloration with ferric chloride	pass
Phenolics	Strong reaction with Folin-Coalter	pass
Terpenoids	Detected via Salkowski's test	pass
Bacosides (Brahmi)	UV-Vis Spectrophotometry (278 nm)	5.2 mg
Tamanolides	HPTLC	4.6 mg

The analysis confirmed that the decoction preserved a wide spectrum of bioactive constituents. Notably, bacosides and tamanolides—key agents known for their neuroprotective and adaptogenic actions—were detected in effective concentrations, indicating that the low-heat extraction method did not compromise their stability. Elevated levels of flavonoids and phenolic compounds were also observed, which is consistent with the formulation's anticipated antioxidant profile.

In particular, the ascorbic acid (vitamin C) content from Amla remained well-preserved, reinforcing the advantage of maintaining a controlled, sub-boiling temperature during preparation. Additionally, the presence of moderate saponin activity and strong phenolic reactions in screening tests further substantiates the tonic's potential therapeutic benefits.

FORMULATION OF HERBAL TONIC:

Name of ingredients	Quantity / concentration	uses
BRAHMI	5 grams	Enhances memory, reduces stress, and supports cognitive development.
MORINGA	5 grams	Provides essential nutrients, antioxidants, and anti-inflammatory benefits.
SHANKHPUSHPI	5 grams	Promotes mental clarity and emotional balance.
ASHWAGANDHA	5 grams	Reduces stress, improves focus, and boosts immunity.
TULSI	5 grams	Strengthens respiratory health and offers adaptogenic properties.
Amla	5 grams	Powerful antioxidant, boosts immunity
CITRIC ACID	0.3 grams	Adjust pH and prevent microbial growth

Procedure:

Step 1: Preparation of the Herbal Extract Base

We began by measuring out the specified quantities of each standardized herbal extract as per our formulation plan. The extracts of Brahmi, Shankpushpi, Ashwagandha, Amla, Tulsi, and Moringa were carefully combined in a clean, sterile stainless-steel container. While mixing, we used a magnetic stirrer to ensure all the extracts blended thoroughly and evenly. Step 2: Dissolving

the Jaggery

Next, we weighed 50 grams of natural jaggery. This was then added to around 300–400 ml of purified water, which we had preheated to about 60–70°C. Under constant stirring, the jaggery dissolved fully. Once it was completely liquefied, we passed the solution through a muslin cloth to remove any visible impurities or sediment.

Step 3: Mixing the Extracts and Jaggery Solution

After filtering the jaggery solution, we allowed it to cool slightly to prevent degradation of any heat sensitive components. Once the temperature dropped below 50°C, we gradually added the combined herbal extract mixture into the jaggery solution, stirring continuously. This helped achieve a uniform blend without forming lumps or inconsistencies.

Step 4: Volume Make-Up and pH Adjustment

We topped up the mixture with the remaining purified water to bring the total volume to exactly 1000 ml. Afterward, we checked the pH using a digital pH meter. To bring the pH within the ideal range of 4.5 to 5.5 (which supports both stability and palatability), we added a small amount of citric acid solution dropwise until the desired range was reached.

Step 5: Preservation (Optional Step)

Since we wanted to test both preservative and preservative-free versions, in one batch, we added a preservative. For this, we dissolved 0.2% sodium benzoate in a small amount of warm water and incorporated it into the final mixture. This step helps extend shelf life and protect against microbial contamination.

Step 6: Final Filtration and Bottling

To ensure clarity and remove any residual particles, we filtered the complete formulation once more using clean muslin cloth. The filtered tonic was then poured into sterile amber glass bottles.

Storage and Stability Notes:

We stored the bottles in a cool, dry cabinet away from sunlight. For the batch without preservative, we refrigerated it and noted that it remained stable and usable for up to 10 days.

Evaluation parameter:

Sensory Evaluation (Organoleptic Assessment)

Upon visual and sensory examination, the tonic appeared as a thick, dark brown liquid with a uniform texture. It had a naturally sweet herbal aroma, primarily due to jaggery and Tulsi. Taste tests indicated a mild sweetness balanced with a gentle bitterness—characteristic of Ashwagandha and Brahmi. The formulation showed slight opacity but no visible particles or sediment, suggesting proper filtration and blending.

Physical and Chemical Characteristics

The formulation was assessed for its basic physicochemical properties:

- **pH:** Measured at 4.8, which falls within the ideal acidic range for syrup-based tonics and ensures microbial resistance.
- **Specific Gravity:** Found to be approximately 1.18, indicating suitable concentration and solute density.
- **Total Solids:** Estimated around 22.4% w/v, confirming adequate extract and jaggery presence.
- **Viscosity:** The syrup showed a viscosity of roughly 145 centipoises at room temperature, consistent with standard herbal liquid preparations.

Phytochemical Screening Results

Qualitative tests were carried out to verify the presence of key plant-based actives:

- **Flavonoids** and **Phenolics** were strongly present, aligning with the antioxidant profile of Amla and Moringa.
- **Alkaloids**, **tannins**, and **saponins** were also positively detected, reflecting contributions from Shankhpushpi and Ashwagandha.
- **Glycosides** and **terpenes** were observed in lower concentrations, but consistently present.

CONCLUSION:

The development and evaluation of the herbal tonic aimed at promoting mental wellness has shown encouraging results. By carefully combining plant extracts known for their cognitive and adaptogenic properties—such as Brahmi, Shankhpushpi, Ashwagandha, Amla, Tulsi, and Moringa—we were able to create a formulation that reflects both traditional knowledge and modern scientific principles.

The preparation process prioritized the preservation of delicate active compounds through low temperature techniques, ensuring that key nutrients like vitamin C and tannins remained effective. The inclusion of natural jaggery not only enhanced palatability but also contributed to the nutritional profile of the tonic.

Upon testing, the formulation showed desirable sensory qualities, stable physicochemical properties, and was free from microbial contamination. Phytochemical screening confirmed the presence of important bioactive such as flavonoids, phenolic compounds, alkaloids, and saponins—each contributing to the tonic's potential role in managing stress, supporting cognitive function, and enhancing overall vitality.

Based on the evaluation data, this herbal tonic appears to be a safe and effective natural supplement for mental wellness. It can serve as a supportive option for individuals experiencing stress, fatigue, or mental exhaustion and may be considered for further development or clinical study.

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