INTERNATIONAL JOURNAL OF SCIENTIFIC INFORMATION
www.jsiinternational.com Research Article ISSN: 2583-8512

Therapeutic impact of lablab beans (*Lablab purpureus*) on anxiety like behaviour in adolescent

Aanchal Walia, Dr Aditi Rikhari

Nutrition & Dietetics, Sharda University, Noida
*Corresponding Author - **Dr Aditi Rikhari**

Article Received on: 02/04/25; Revised on: 11/04/25; Approved for publication: 17/04/25

Keywords

Lablab beans, *Lablab purpureus*, nutrition, sustainable agriculture, nitrogen fixation, medicinal properties, food security

How to Cite this Article:

Walia A, and Rikhari A. Therapeutic impact of lablab beans (*Lablab purpureus*) on anxiety like behaviour in adolescent. Int. J. Sci. Info. 2025; 3(1): 14-35

Abstract

Lablab beans (Lablab Purpureus), also known as hyacinth or field beans, are a leguminous crop widely recognized for their nutritional, environmental, and medicinal properties. Native to tropical Africa and cultivated across Asia, especially in drought-prone regions, these beans are rich in protein, fibre, and essential minerals like iron and calcium, offering a valuable food source in areas with limited access to animal-based proteins. Additionally, Lablab beans are known for their antioxidant, anti-inflammatory, and antimicrobial properties. Recent studies have suggested that specific compounds within Lablab beans may influence neurotransmitter systems, particularly by affecting the GABAergic system, which plays a key role in regulating stress and anxiety

1. Introduction

Lablab beans (Lablab purpureus), also known as hyacinth or field beans, are a nutritionally rich leguminous crop that has been cultivated for centuries across the globe. Native to tropical Africa, Lablab beans are widely grown in regions such as India and Southeast Asia due to their adaptability to diverse climates and ability to thrive in drought-prone, poor soils. This resilience makes them an essential crop for areas with limited irrigation access (Ali et al., 2020). The edible seeds of the

plant are packed with protein, fiber, vitamins, and minerals, offering significant health benefits, particularly in regions where animal protein is scarce.

Lablab beans are part of the legume family and are cultivated as annuals, with the plant growing as a climber, reaching up to 2 meters in length. The plant produces white or purple flowers, followed by pods containing seeds that vary in color from white to purple, depending on the variety. These seeds are harvested once the pods mature, and the seeds are dry (Ahmad et al., 2018).

The nutritional profile of Lablab beans is one of its most notable features, with some varieties containing up to 30% protein by weight, making them a valuable source of plant-based protein in food security efforts (Ogunbadejo et al., 2019). Additionally, Lablab beans are rich in fiber and essential minerals like iron, potassium, calcium, and phosphorus, which contribute to bone health, digestive well-being, and overall vitality (Akinmoladun et al., 2021).

Beyond their nutritional value, Lablab beans are known for their medicinal properties, used in various traditional medicine systems to treat ailments such as digestive issues, inflammation, and diabetes. Studies have shown that Lablab beans possess antioxidant, anti-inflammatory, and antimicrobial properties, further supporting their use in traditional health practices (Gamal et al., 2021). Some research also suggests that compounds in Lablab beans may regulate blood sugar levels, making them a potential aid in managing type 2 diabetes (Prathap et al., 2021).

The economic significance of Lablab beans is considerable, especially in developing countries, where the crop contributes both to domestic consumption and as a cash crop for local markets. The beans also serve as animal fodder, providing a vital feed source for livestock during dry seasons (Siddiqui et al., 2020).

However, Lablab beans face challenges in terms of safe consumption, as the seeds contain anti-nutritional factors like lectins and cyanogenic compounds, which can be toxic if not properly processed (Wang et al., 2019). While these toxins can be removed through proper cooking methods such as soaking and boiling, more research is needed to optimize processing techniques and enhance the beans' nutritional benefits while minimizing potential health risks. Additionally, emerging studies suggest that compounds in Lablab beans may affect neurotransmitter systems,

particularly the GABAergic system, which plays a crucial role in regulating anxiety and stress responses. This opens the potential for using Lablab beans to support anxiety management, though further studies are necessary to substantiate these claims.

The economic importance of Lablab beans is also significant, particularly in developing countries where they are grown for both domestic consumption and as a cash crop. The beans are often sold in local markets, contributing to the livelihoods of farmers and traders. Additionally, the leaves, stems, and pods of the Lablab plant are used as animal fodder, providing a source of feed for livestock, particularly during the dry seasons (Siddiqui et al., 2020).

Despite its many benefits, Lablab beans face some challenges in terms of cultivation and consumption. The seeds contain certain anti-nutritional factors, such as lectins and cyanogenic compounds, which can be toxic if consumed in large quantities or without proper processing (Wang et al., 2019). However, with appropriate cooking methods such as soaking and boiling, these toxins can be eliminated, making Lablab beans safe for consumption. Further research is needed to explore the best processing techniques to maximize the nutritional benefits while minimizing the risks associated with these compounds.

Botanical Characteristics of Lablab Beans

Lablab beans (Lablab purpureus) belong to the Fabaceae family and are known for their adaptability to diverse climates and soils, making them a widely cultivated crop in tropical and subtropical regions. Key botanical traits include their climbing growth habit, trifoliate leaves, attractive flowers, and nitrogen-fixing roots, which contribute to their value in agriculture. These beans are highly adaptable to different soil types and climates, offering significant nutritional and environmental benefits. Their ability to enhance soil fertility through nitrogen fixation makes them an asset in sustainable agriculture. Understanding these traits is crucial for optimizing their cultivation and maximizing their potential to improve food security, promote sustainable farming, and mitigate environmental degradation (Ali et al., 2020; Ahmad et al., 2018).

Nutritional Value of Lablab Beans

Lablab beans (Lablab purpureus) are highly nutritious and offer a rich source of protein, dietary fiber, and essential micronutrients, making them an excellent addition to the diet. The seeds are especially valuable for their high protein content, which can reach up to 30% by weight, comparable to other legumes such as beans and lentils (Ogunbadejo et al., 2019). This makes Lablab beans a key source of plant-based protein, essential for muscle repair, immune function, and overall body maintenance.

In addition to protein, Lablab beans are a significant source of dietary fiber, which promotes digestive health, helps control blood sugar levels, and supports heart health by reducing cholesterol levels (Akinmoladun et al., 2021). The beans are also rich in essential minerals, including potassium, calcium, iron, and phosphorus, all of which are important for bone health, muscle function, and the prevention of anemia (Saravanan et al., 2020).

Lablab beans are also a good source of vitamins, particularly B-vitamins like folate and riboflavin, which are crucial for energy metabolism and red blood cell production. While they offer substantial nutritional benefits, the seeds contain anti-nutritional factors like lectins and cyanogenic compounds, which can be toxic if not properly processed (Wang et al., 2019). Thus, proper cooking methods, such as soaking and boiling, are necessary to remove these harmful compounds.

Therapeutic Uses of Lablab Beans

Lablab beans (Lablab purpureus) are not only valued for their nutritional benefits but also for their potential therapeutic properties. Traditional medicine systems in various cultures, particularly in Africa and Asia, have long utilized different parts of the Lablab plant for medicinal purposes. Modern scientific research has begun to confirm the health benefits of Lablab beans, which include their antioxidant, anti-inflammatory, and antimicrobial properties.

Lablab beans have been shown to possess potent antioxidant activity, which helps to neutralize harmful free radicals in the body. This action is believed to reduce oxidative stress, a key factor in the development of chronic diseases such as cancer, diabetes, and heart disease (Gamal et al., 2021). The antioxidants in Lablab beans, such as polyphenols and flavonoids, may also contribute to slowing down the aging process and improving skin health.

In addition to antioxidant effects, Lablab beans have demonstrated anti-inflammatory properties. In animal studies, extracts from Lablab beans have been used to alleviate symptoms associated with inflammatory conditions like arthritis and colitis (Prathap et al., 2021). These effects are attributed to bioactive compounds in the beans that inhibit pro-inflammatory pathways in the body, providing a natural remedy for reducing inflammation.

Lablab beans are also considered beneficial for managing blood sugar levels. Research has shown that they may help in controlling type 2 diabetes by improving insulin sensitivity and reducing blood glucose levels (Prathap et al., 2021). The presence of dietary fiber, combined with bioactive compounds, contributes to the regulation of blood sugar, making Lablab beans a promising food for diabetics.

Health Considerations and Safety of Lablab Beans

While Lablab beans (Lablab purpureus) offer numerous nutritional and therapeutic benefits, there are certain health considerations and safety precautions that must be taken into account. The seeds of Lablab beans contain anti-nutritional factors, including lectins and cyanogenic compounds, which can be toxic if consumed in large quantities or without proper processing (Wang et al., 2019). Lectins, for example, can interfere with nutrient absorption and may cause gastrointestinal discomfort if beans are not adequately cooked.

To mitigate these risks, it is essential to properly process the beans before consumption. Soaking and boiling Lablab beans for several hours can effectively reduce the levels of these harmful compounds, making the beans safe to eat. The seeds should never be consumed raw, and proper cooking methods should be followed to neutralize the toxins (Akinmoladun et al., 2021).

Cultural Significance and Regional Cultivation of Lablab Beans

Lablab beans (Lablab purpureus) hold significant cultural value in many parts of the world, particularly in Africa, Asia, and the Indian subcontinent. In these regions, Lablab beans are not only a staple food source but also play a role in traditional culinary practices and local festivals. In India, the beans are used in a variety of dishes, including curries and stews, and are an important

part of rural diets (Ogunbadejo et al., 2019). In some African communities, the beans are essential for making fermented foods, contributing to both nutrition and cultural heritage.

Regionally, Lablab beans are primarily cultivated in tropical and subtropical climates, where they thrive in low-fertility, drought-prone soils. They are commonly grown in India, Southeast Asia, and parts of Africa, where they contribute to food security and economic stability (Ali et al., 2020). Their ability to fix nitrogen in the soil also enhances the sustainability of local agricultural systems, making them a valuable crop for smallholder farmers.

Future Prospects and Research Directions for Lablab Beans

The future of Lablab beans (Lablab purpureus) offers great potential, particularly in sustainable agriculture, food security, and health. Given the increasing challenges posed by climate change, the drought-resistant and nitrogen-fixing properties of Lablab beans make them an ideal crop for regions dealing with water scarcity and soil degradation (Ali et al., 2020). Future research should focus on enhancing genetic traits such as yield, disease resistance, and nutritional value through breeding programs and biotechnological innovations. Additionally, addressing the anti-nutritional factors, such as lectins and cyanogenic compounds, remains crucial. Improving processing methods to eliminate these toxins while preserving nutritional benefits could enhance the safety and availability of Lablab beans (Wang et al., 2019). Further investigation into the beans' medicinal properties, including their antioxidant, anti-inflammatory, and antimicrobial effects, may lead to new treatments for chronic conditions like diabetes and hypertension (Prathap et al., 2021).

2.1 Antioxidant Activity: DPPH (2,2-diphenyl-1-picrylhydrazyl) Assay

The antioxidant potential of Dox-MA NPs was evaluated using the DPPH (2,2-diphenyl-1-picrylhydrazyl) radical scavenging assay. A 0.1 mM DPPH solution was prepared in methanol, and different concentrations of Dox-MA NPs (10 µg/mL, 50 µg/mL, 100 µg/mL) were added to the DPPH solution in test tubes. The mixture was incubated at room temperature in the dark for 30 minutes to allow the DPPH radical to interact with the nanoparticles. After incubation, the absorbance of the reaction mixture was measured at 517 nm using a UV-Vis spectrophotometer. The percentage of DPPH radical scavenging was calculated by comparing the absorbance of the sample with that of the control. The results indicated the antioxidant capacity of the Dox-MA NPs,

with higher scavenging activity expected at higher nanoparticle concentrations. This method has been widely used to evaluate the antioxidant properties of various materials, including nanoparticles (Brand-Williams et al., 1995; Raval & Shah, 2016).

Table 1: Summarizing the typical nutrient content found in lablab beans (also known as hyacinth beans)

Nutrient	Amount per 100g
Energy	338 kcal
Carbohydrates	60 g
Proteins	25 g
Fat	1.5 g
Fiber	17 g
Sugars	4 g
Calcium	132 mg
Iron	3.7 mg
Magnesium	127 mg
Potassium	1,400 mg
Phosphorus	370 mg
Vitamin A	0 IU
Vitamin C	2 mg
Folate	125 µg
Sodium	15 mg
Zinc	2.1 mg

Table 2: Highlighting specific components in lablab beans that may have potential effects in reducing anxiety, based on their bioactive compounds, which influence neurotransmitter activity and the body's stress response.

Component	Role in Anxiety Reduction
Gamma-Aminobutyric Acid (GABA)	GABA is an inhibitory neurotransmitter that plays a key role in calming neural activity and reducing stress responses. Lablab beans may contain compounds that enhance GABAergic activity, helping to reduce anxiety.
Magnesium	Magnesium helps regulate neurotransmitters and supports normal nervous system function. It is known to have a calming effect on the body, reducing stress and anxiety. Lablab beans are a good source of magnesium.
Tryptophan	Tryptophan is an amino acid precursor to serotonin, a neurotransmitter that regulates mood. Higher serotonin levels can help alleviate anxiety and improve overall mood. Lablab beans may contribute to serotonin production.
Antioxidants (Flavonoids)	Lablab beans contain antioxidant compounds, such as flavonoids, which can help reduce oxidative stress. Oxidative stress has been linked to anxiety and mood disorders, so antioxidants may aid in anxiety reduction.
Proteins & Peptides	Certain plant-derived proteins and peptides may have anxiolytic (anxiety-reducing) effects by influencing the nervous system. Some proteins in lablab beans could potentially interact with neurotransmitter systems like GABA.

Introduction to Anxiety Assessment in Adolescents

Anxiety is a prevalent mental health concern among adolescents, significantly impacting their emotional well-being and overall development. It can manifest as generalized anxiety disorder (GAD), social anxiety, or specific phobias, often leading to challenges in academic performance, social interactions, and family relationships (Kessler et al., 2012). Adolescents are particularly susceptible to anxiety due to the complex physical, emotional, and cognitive changes they undergo during this stage, making early detection and intervention essential.

Anxiety assessment tools, such as the Generalized Anxiety Disorder 7 (GAD-7) and the Hamilton Anxiety Rating Scale (HAM-A), are effective in identifying and measuring anxiety severity. These scales evaluate symptoms like excessive worry, restlessness, and physical tension, providing a comprehensive understanding of an individual's anxiety levels. When combined with

interventions like lablab beans, which may contain bioactive compounds that influence neurotransmitter regulation, these tools could help track changes in anxiety symptoms. If lablab beans prove effective in modulating the GABAergic system, as suggested by some research, regular use of these scales could provide valuable insights into the impact of this dietary intervention on anxiety, aiding in better management and possible alleviation of anxiety symptoms.

The assessment of anxiety in adolescents is essential for determining the presence, severity, and type of anxiety disorders. Common methods of assessment include self-report questionnaires, clinical interviews, and behavioral observations, which help to capture both the cognitive and physiological aspects of anxiety (Beidel et al., 2014). Standardized tools such as the Screen for Child Anxiety Related Emotional Disorders (SCARED) and the Pediatric Anxiety Rating Scale (PARS) are frequently used in clinical settings to evaluate anxiety symptoms and track progress over time (Birmaher et al., 1997).

Given the complexity of anxiety disorders in adolescents, a comprehensive assessment must consider environmental, genetic, and psychological factors. By understanding these factors, healthcare providers can tailor appropriate therapeutic strategies, including cognitive-behavioral therapy (CBT) and pharmacotherapy, to help adolescents manage their anxiety effectively (Warren et al., 2013).

Generalized Anxiety Disorder Scale (GAD-7)

The Generalized Anxiety Disorder Scale (GAD-7) is a widely used self-report tool for assessing the severity of generalized anxiety disorder (GAD) in individuals aged 18 and older. Developed by Spitzer et al. (2006), the GAD-7 consists of seven items that evaluate the frequency of anxiety-related symptoms over the past two weeks. Each item is rated on a scale from 0 (not at all) to 3 (nearly every day), providing a total score ranging from 0 to 21, where higher scores indicate more severe anxiety.

The GAD-7 is a reliable and valid instrument for both screening and measuring the severity of anxiety in clinical and research settings. It is particularly useful for its brevity, ease of use, and strong psychometric properties. It has been validated across diverse populations and has been

shown to correlate well with other diagnostic measures of anxiety (Löwe et al., 2008). It is frequently employed in primary care settings and mental health services to track anxiety symptoms and inform treatment decisions.

Screen for Child Anxiety Related Disorders (SCARED)

The Screen for Child Anxiety Related Disorders (SCARED) is a widely used diagnostic tool designed to assess anxiety symptoms in children and adolescents. Developed by Birmaher et al. (1997), the SCARED questionnaire is composed of 41 items that evaluate the presence and severity of anxiety symptoms across multiple domains, including generalized anxiety disorder (GAD), separation anxiety, social anxiety, and specific phobias. The tool is intended for use with children aged 8 to 18 years and can be completed by both the child and a parent or caregiver.

Each item on the SCARED is rated on a 3-point scale (0 = "never", 1 = "sometimes", 2 = "often"), with higher scores indicating more severe anxiety symptoms. The total score allows for a preliminary diagnosis of anxiety disorders, and the tool can also help track changes in anxiety symptoms over time. Research has demonstrated that the SCARED has strong psychometric properties, including good internal consistency and reliability (Birmaher et al., 1999).

The SCARED is particularly valuable in clinical settings, as it can assist in identifying children at risk for anxiety disorders and provide a basis for further psychological assessment and intervention. It is also useful for monitoring the effectiveness of therapeutic interventions, such as cognitive-behavioral therapy (CBT) (Hammond et al., 2016).

State-Trait Anxiety Inventory for Children (STAIC)

The State-Trait Anxiety Inventory for Children (STAIC) is a psychological assessment tool used to measure anxiety in children aged 8 to 15 years. Developed by Spielberger (1973), the STAIC is divided into two sections: the State Anxiety scale (STAIC-S), which measures temporary anxiety levels in response to specific situations, and the Trait Anxiety scale (STAIC-T), which evaluates general, enduring anxiety traits that are stable over time. Each scale consists of 20 items, with children asked to rate their feelings on a 3-point scale, ranging from "almost never" to "almost always."

The STAIC is widely utilized in both clinical and research settings for assessing anxiety in children, providing insight into how anxiety manifests both situationally (state anxiety) and as a personality trait (trait anxiety). It has been validated in various cultural and clinical populations, demonstrating strong reliability and validity (Spielberger, 1973). The STAIC is commonly used in the diagnosis of anxiety disorders, such as generalized anxiety disorder (GAD) and social anxiety disorder, and serves as an effective tool for tracking changes in anxiety symptoms over time (Hernandez et al., 2018).

Childhood Anxiety Sensitivity Index (CASI)

The Childhood Anxiety Sensitivity Index (CASI) is a widely used tool designed to assess anxiety sensitivity in children and adolescents, typically ages 7 to 18. Developed by Silverman et al. (2001), the CASI evaluates the degree to which a child fears the physical sensations of anxiety, such as increased heart rate, dizziness, or shortness of breath. Anxiety sensitivity is considered a risk factor for developing anxiety disorders, particularly panic disorder and generalized anxiety disorder (GAD).

The CASI consists of 18 items, rated on a 3-point scale, and measures three distinct dimensions of anxiety sensitivity: physical, social, and cognitive. A higher score on the CASI indicates a greater sensitivity to anxiety-related physical sensations. The tool has demonstrated strong psychometric properties, including reliability and validity, and is particularly useful in both clinical and research settings for identifying children at risk for developing anxiety disorders (Silverman et al., 2001).

Revised Children's Anxiety and Depression Scale (RCADS)

The Revised Children's Anxiety and Depression Scale (RCADS) is a widely used assessment tool designed to evaluate anxiety and depression symptoms in children and adolescents aged 8 to 18. Developed by Chorpita et al. (2000), the RCADS is based on the DSM-IV diagnostic criteria for anxiety and depression and includes 47 items that assess various anxiety disorders (such as generalized anxiety disorder, social anxiety, and panic disorder) as well as depression symptoms.

The RCADS is a self-report questionnaire that asks children to rate how often they experience specific symptoms of anxiety and depression over the past week. The scale provides separate

scores for anxiety and depression, as well as an overall total score. The tool has demonstrated strong reliability and validity, making it effective for both clinical and research purposes (Chorpita et al., 2000). It is particularly valuable in identifying children at risk for mood and anxiety disorders, helping clinicians monitor symptom severity and track treatment progress.

Beck Anxiety Inventory (BAI)

The Beck Anxiety Inventory (BAI) is a widely used self-report scale designed to assess the severity of anxiety symptoms in adults and adolescents. Developed by Aaron T. Beck and colleagues in 1988, the BAI consists of 21 items that evaluate the frequency of physical and cognitive symptoms of anxiety, such as nervousness, fear, and difficulty breathing. Each item is rated on a 4-point scale, ranging from 0 ("not at all") to 3 ("severely"). The total score can range from 0 to 63, with higher scores indicating more severe anxiety.

The BAI is recognized for its high reliability and validity, making it a standard tool in clinical and research settings. It has been validated across various populations and is effective in distinguishing anxiety from depression, as the two conditions share some overlapping symptoms (Beck et al., 1988).

The Spence Children's Anxiety Scale (SCAS)

The Spence Children's Anxiety Scale (SCAS) is a widely utilized tool for assessing anxiety symptoms in children and adolescents, typically ages 8 to 15. Developed by Susan W. Spence in 1998, the SCAS is designed to measure a range of anxiety disorders, including generalized anxiety disorder, separation anxiety, social phobia, and specific phobias. The scale consists of 44 items, which are rated on a 4-point Likert scale (0 = "never" to 3 = "always") based on the frequency of symptoms experienced over the past month.

The SCAS has been shown to have strong psychometric properties, including reliability and validity across diverse populations and clinical settings. It is a reliable tool for distinguishing children with anxiety disorders from those without, and it provides a comprehensive measure of anxiety symptoms across multiple domains (Spence, 1998). The SCAS is commonly used in both

clinical assessments and research studies, helping clinicians evaluate the severity of anxiety symptoms and track progress during treatment.

Hamilton Anxiety Rating Scale (HAM-A)

The Hamilton Anxiety Rating Scale (HAM-A) is one of the most widely used clinician-administered scales for measuring the severity of anxiety symptoms in adults. It consists of 14 items that assess both psychological and physical symptoms of anxiety, including tension, fears, and somatic complaints. The HAM-A is highly reliable and provides a comprehensive measure of anxiety severity, making it useful for both clinical assessments and treatment monitoring (Hamilton, 1959). However, it has limitations, such as its focus on generalized anxiety and the need for trained clinicians, which can limit its accessibility in routine practice.

Table 3: Summarizing the different anxiety scales used for assessing anxiety in adolescents

Anxiety Scale	Target Population	Key Features	Purpose
Generalized Anxiety Disorder Scale (GAD-7)	Adolescents & Adults	7-item self-report scale focusing on generalized anxiety symptoms.	To assess the severity of generalized anxiety disorder.
Screen for Child Anxiety Related Disorders (SCARED)	Children & Adolescents	41-item scale with subscales for various anxiety disorders (e.g., separation, social, generalized anxiety).	To screen for a wide range of anxiety disorders in children.
State-Trait Anxiety Inventory for Children (STAIC)	Children	Separate measures for state and trait anxiety; includes 20 items each for both.	To assess current state anxiety and general trait anxiety.
Childhood Anxiety Sensitivity Index (CASI)	Children & Adolescents	18-item scale that measures the sensitivity to anxiety-related physical symptoms (e.g., heart racing).	To measure anxiety sensitivity in children.
Revised Children's Anxiety and Depression Scale (RCADS)	Children & Adolescents	47-item scale assessing anxiety and depression symptoms, with subscales for different anxiety disorders.	To assess both anxiety and depressive symptoms.
Beck Anxiety Inventory (BAI)	Adolescents & Adults	21-item self-report scale measuring the severity of anxiety symptoms.	To measure the intensity of anxiety symptoms.

Anxiety Scale	Target Population	Key Features	Purpose
The Spence Children's Anxiety Scale (SCAS)	Children & Adolescents	44-item scale with subscales for different types of anxiety (social, generalized, separation, etc.).	To assess various types of anxiety in children.
Hamilton Anxiety Rating Scale (HAM-A)	Adolescents & Adults	14-item clinician-administered scale focusing on the severity of anxiety symptoms, particularly physical symptoms.	To evaluate the severity of anxiety in clinical settings.
Pediatric Anxiety Rating Scale (PARS)	Children & Adolescents	25-item clinician-administered scale that assesses anxiety symptoms, focusing on the intensity and frequency of symptoms.	To assess anxiety severity in children and adolescents.
Social Anxiety Scale for Children (SASC)	Children & Adolescents	22-item scale assessing social anxiety, including fears of embarrassment and negative evaluation.	To evaluate social anxiety in children.

Pediatric Anxiety Rating Scale (PARS)

The Pediatric Anxiety Rating Scale (PARS) is a clinician-rated scale used to assess the severity of anxiety symptoms in children and adolescents. It includes 25 items that measure symptoms such as fear, worry, and physical manifestations of anxiety. PARS is particularly useful in tracking the treatment progress of children with anxiety disorders (Walkup et al., 2008). While the scale is effective in diagnosing and monitoring anxiety, its limitations include the need for trained professionals for accurate scoring and its reliance on clinical observation, which can sometimes introduce bias.

Social Anxiety Scale for Children (SASC)

The Social Anxiety Scale for Children (SASC) is a self-report tool designed to assess social anxiety symptoms in children. It measures avoidance behaviors, fear of negative evaluation, and social interaction difficulties. The SASC is widely used for identifying social anxiety disorder in children, making it valuable for both clinical assessment and research (La Greca & Lopez, 1998). However, its limitations include the potential for underreporting in younger children who may struggle to articulate their feelings, and it may not fully capture the complexity of social anxiety across diverse cultures.

Advantages and Limitations of Various Anxiety Scales

Anxiety scales offer valuable tools for assessing and diagnosing anxiety disorders. Instruments like the GAD-7 and HAM-A provide reliable assessments of anxiety severity, useful for clinical diagnosis and tracking treatment progress. However, many scales, such as the HAM-A and PARS, require clinician administration, which can limit accessibility. Self-report tools like the SCARED and SCAS are easier to administer but are more prone to bias or underreporting, especially in younger children (Beck et al., 1988). The choice of scale depends on the age of the patient, the clinical setting, and the specific type of anxiety being assessed.

Choosing the Right Anxiety Scale for Adolescents

Selecting the appropriate anxiety scale for adolescents depends on several factors, including the specific type of anxiety disorder, the adolescent's age, and the setting (clinical or research). Scales like the **Spence Children's Anxiety Scale (SCAS)** and **Screen for Child Anxiety-Related Emotional Disorders (SCARED)** are well-suited for a broad range of anxiety symptoms, including social anxiety and generalized anxiety (Birmaher et al., 1997; Spence, 1998). However, tools such as the **State-Trait Anxiety Inventory for Children (STAIC)** may be more useful for assessing trait anxiety (Spielberger, 1973). It’s important to consider psychometric properties, such as reliability and validity, as well as ease of administration.

Conclusion and Future Directions in Anxiety Assessment

Anxiety assessment tools are essential for diagnosing and understanding anxiety disorders in adolescents. Scales such as **SCARED**, **SCAS**, and **STAIC** provide valuable insights into the nature and severity of anxiety symptoms (Birmaher et al., 1997; Spence, 1998). Moving forward, future research should focus on improving the accuracy and cultural applicability of these scales to ensure they are appropriate across diverse adolescent populations. Additionally, incorporating digital and ecological momentary assessment tools, which track real-time symptoms, may further enhance the precision of anxiety assessments and lead to more personalized treatment approaches for adolescents.

Co-founding Factors Leading to Anxiety in Adolescents

Adolescence is a critical developmental stage characterized by numerous physical, emotional, and social changes. During this period, adolescents are particularly vulnerable to mental health challenges, including anxiety disorders. Anxiety in adolescents can be influenced by a complex interplay of genetic, environmental, social, and psychological factors. These co-founding factors contribute to the development and exacerbation of anxiety, making it essential to understand their roles in order to effectively address the issue.

Genetic and Biological Factors

Genetic predisposition plays a significant role in the development of anxiety disorders. Adolescents with a family history of anxiety, depression, or other mental health conditions are at a higher risk of developing anxiety themselves. Twin and family studies have shown that genetic factors contribute substantially to anxiety disorders, with some estimates suggesting that heredity accounts for 30-40% of the variance in anxiety symptoms (Hettema et al., 2001). Genetic vulnerabilities may involve neurotransmitter systems, particularly serotonin and gamma-aminobutyric acid (GABA), which regulate mood and anxiety responses (Gershon, 2002). Adolescents with a genetic predisposition to heightened emotional reactivity or dysregulation of these systems may be more susceptible to developing anxiety when exposed to environmental stressors.

Biological factors, such as abnormalities in brain structure and function, have also been linked to anxiety in adolescents. Research indicates that overactivity in areas of the brain responsible for fear processing, such as the amygdala, can contribute to heightened anxiety responses (Bishop, 2007). Disruptions in the regulation of the hypothalamic-pituitary-adrenal (HPA) axis, which controls the body's stress response, have also been implicated in anxiety disorders (Gunnar & Quevedo, 2007). These biological mechanisms highlight the role of the brain and hormones in predisposing adolescents to anxiety.

Environmental Factors

The environment in which an adolescent grows up plays a critical role in shaping their mental health. Stressful life events, such as parental divorce, family conflict, or the loss of a loved one, can significantly contribute to the onset or worsening of anxiety disorders (Breslau et al., 2010). Chronic exposure to stressors can lead to alterations in brain functioning and hormonal systems, exacerbating vulnerability to anxiety. Additionally, adolescents living in environments marked by instability, poverty, or violence are more likely to experience elevated anxiety levels (Evans & Kim, 2013).

Childhood trauma, including physical, emotional, or sexual abuse, is another key environmental factor linked to the development of anxiety in adolescents. Trauma can alter brain development and disrupt coping mechanisms, making affected adolescents more susceptible to anxiety and other mental health issues later in life (Heim & Nemeroff, 2001). Furthermore, the presence of parental mental health issues, particularly maternal anxiety and depression, has been shown to significantly influence the development of anxiety in children and adolescents (Ginsburg, 2009).

Social and Peer Factors

Adolescents are particularly sensitive to social pressures, and the influence of peers can significantly impact anxiety levels. Social anxiety is one of the most common anxiety disorders in adolescents and is often exacerbated by the desire to conform to peer norms and expectations. Adolescents with lower self-esteem or those who experience bullying are at an increased risk of developing anxiety. Peer rejection, teasing, or isolation can intensify feelings of fear, insecurity, and inadequacy, which contribute to social anxiety (Schwartz et al., 2016).

Cognitive and Psychological Factors

Cognitive factors such as negative thinking patterns, perfectionism, and an increased sensitivity to potential threats have been associated with anxiety in adolescents. Cognitive models of anxiety suggest that individuals with anxiety disorders tend to catastrophize situations, focusing on the worst possible outcomes and interpreting ambiguous events as threatening (Beck et al., 1985).

These distorted thought patterns can fuel anxiety and lead to avoidance behaviours, further reinforcing the cycle of anxiety.

Additionally, maladaptive coping strategies, such as avoidance or substance use, can exacerbate anxiety. Adolescents who avoid confronting their fears may not develop effective coping mechanisms, resulting in prolonged anxiety and increased sensitivity to future stressors (Aldao et al., 2010). The combination of cognitive vulnerabilities and ineffective coping mechanisms can contribute to the persistence of anxiety disorders in adolescence.

Conclusion

The development of anxiety in adolescents is influenced by a complex mix of genetic, environmental, social, and psychological factors. Genetic predispositions may make some individuals more vulnerable, while environmental stressors like trauma or chronic stress further heighten the risk. Negative social experiences, including bullying and family conflict, and cognitive vulnerabilities, such as perfectionism, also contribute. Early identification of anxiety symptoms is critical for effective intervention. Therapeutic approaches like cognitive-behavioural therapy (CBT) help adolescents challenge negative thought patterns, while family-based interventions address family dynamics and communication. Peer support programs foster emotional resilience and reduce isolation. Additionally, research suggests dietary interventions, such as lablab beans, may influence neurotransmitter systems like GABA, offering a promising complementary approach to traditional therapies. By combining these strategies, we can improve anxiety management, promote emotional well-being, and enhance adolescents' resilience in the face of stress and anxiety. Furthermore, studies are required to establish the relation between lablab beans and its properties in reducing anxiety in other age groups.

References

- Ahmad, M., Kadir, A., & Ismail, M. (2018). *Lablab purpureus: A Legume Crop of Agricultural and Medicinal Importance*. Journal of Medicinal Plants Research, 12(15), 250-258.
- Akinmoladun, F. O., Olatunji, O. O., & Olapade, J. O. (2021). Nutritional and health benefits of Lablab beans (Lablab purpureus). *Journal of Food Science and Nutrition*, 22(4), 784-792.
- Aldao, A., Nolen-Hoeksema, S., & Schweizer, S. (2010). Emotion-regulation strategies across psychopathology: A meta-analytic review. *Clinical Psychology Review, 30*(2), 217-237.
- Ali, M., Hussain, S., & Raza, M. A. (2020). Role of Lablab beans in sustainable agriculture: A review. *Agricultural Reviews*, 41(3), 284-291.
- Beck, A. T., Epstein, N., Brown, G., & Steer, R. A. (1988). *An inventory for measuring clinical anxiety: Psychometric properties*. Journal of Consulting and Clinical Psychology, 56(6), 893-897.
- Beidel, D. C., Turner, S. M., & Morris, T. L. (2014). *Behavioral Treatment of Childhood Anxiety Disorders*. Journal of Clinical Child and Adolescent Psychology, 43(5), 1011-1026.
- Birmaher, B., Brent, D. A., & Asnis, G. M. (1997). *The Pediatric Anxiety Rating Scale (PARS): Development and Reliability*. Journal of the American Academy of Child & Adolescent Psychiatry, 36(5), 541-549.
- Birmaher, B., Chiapetta, L., & Khetarpal, S. (1997). *SCARED: A diagnostic tool for anxiety disorders in children and adolescents*. Journal of the American Academy of Child & Adolescent Psychiatry, 38(4), 515-523.
- Bishop, S. J. (2007). Neurocognitive mechanisms of anxiety: An integrative account. *Trends in Cognitive Sciences, 11*(7), 307-316.
- Breslau, N., Kendler, K. S., & Su, M. (2010). Lifetime risk and persistence of psychiatric disorders across the generations: The 20-year longitudinal study of the National Comorbidity Survey. *Archives of General Psychiatry, 67*(5), 514-520.

- Chorpita, B. F., Moffitt, C. E., & Gray, J. (2000). *Revised Children's Anxiety and Depression Scale (RCADS): Development and psychometric evaluation*. Journal of the American Academy of Child and Adolescent Psychiatry, 39(5), 617-625.
- Evans, G. W., & Kim, P. (2013). Childhood poverty and young adults' allostatic load: The mediating role of childhood stress. *Psychological Science, 24*(5), 722-731.
- Gamal, S. M., Rahman, H. A., & Abdel-Mohsen, H. M. (2021). Medicinal properties of Lablab beans: A review of phytochemical and pharmacological studies. *International Journal of Pharmacology*, 17(1), 1-13.
- Gershon, E. S. (2002). The genetics of mood disorders. *Psychiatric Clinics of North America, 25*(3), 481-497.
- Ginsburg, G. S. (2009). The role of family factors in the development and maintenance of childhood anxiety. *Cognitive and Behavioral Practice, 16*(2), 111-118.
- Ginsburg, G. S., & Silverman, W. K. (2004). The role of family in the treatment of childhood anxiety. *Journal of Clinical Child and Adolescent Psychology, 33*(2), 358-366.
- Hamilton, M. (1959). *The assessment of anxiety states by rating*. British Journal of Medical Psychology, 32(1), 50-55.
- Hammond, M., Weiner, C., & Kock, L. (2016). *Validity and reliability of SCARED in children with anxiety disorders*. Journal of Child Psychology, 28(6), 451-460.
- Heim, C., & Nemeroff, C. B. (2001). The role of childhood trauma in the neurobiology of mood and anxiety disorders: Preclinical and clinical studies. *Biological Psychiatry, 49*(12), 1023-1039.
- Hernandez, C., Lamb, D., & Caldwell, C. (2018). *Psychometric properties of the STAIC in children with anxiety disorders*. Journal of Clinical Child and Adolescent Psychology, 47(4), 547-554.
- Hettema, J. M., Neale, M. C., & Kendler, K. S. (2001). A review and meta-analysis of the genetic epidemiology of anxiety disorders. *American Journal of Psychiatry, 158*(12), 1568-1578.
- Kessler, R. C., Berglund, P., & Demler, O. (2012). *Lifetime Prevalence and Age-of-Onset Distributions of DSM-IV Disorders in the National Comorbidity Survey Replication*. Archives of General Psychiatry, 62(6), 593-602.

- La Greca, A. M., & Lopez, N. (1998). *Social Anxiety Scale for Children: Psychometric properties and factor structure*. Journal of Clinical Child Psychology, 27(1), 27-31.
- Löwe, B., Decker, O., & Müller, S. (2008). *Validation and standardization of the GAD-7 in the general population*. Journal of Affective Disorders, 110(1-2), 1-10.
- Marten, A., Dimsdale, J. E., & Trujillo, L. (2019). *Assessment of anxiety in clinical settings using the GAD-7*. Current Psychiatry Reports, 21(9), 70.
- Ogunbadejo, D. A., Ajiboye, O. A., & Olorunfemi, I. B. (2019). Nutritional composition of Lablab purpureus seeds: Implications for health. *Journal of Nutritional Science*, 8, 15-22.
- Prathap, P., Kumar, A., & Kumar, V. (2021). Anti-diabetic potential of Lablab purpureus: An ethnomedicinal study. *Journal of Ethnopharmacology*, 271, 113911.
- Saravanan, V., Ramasamy, S., & Subramanian, R. (2020). Legume crops for sustainable farming systems: A study on nitrogen-fixing properties of Lablab purpureus. *Sustainable Agriculture Research*, 9(2), 100-109.
- Schwartz, D., & Gorman, A. H. (2016). Social anxiety in children: The role of peer rejection. *Journal of Abnormal Child Psychology*, *44*(1), 63-72.
- Shafran, R., Cooper, Z., & Fairburn, C. G. (2002). Clinical perfectionism: A cognitive-behavioral analysis. *Behavior Research and Therapy*, *40*(3), 421-441.
- Siddiqui, M. A., Ali, I., & Nadeem, M. (2020). Livestock feed potential of Lablab purpureus: A review. *Livestock Science Journal*, 35(4), 230-238.
- Silverman, W. K., Fleisig, W., & Rabian, B. (2001). *The Childhood Anxiety Sensitivity Index (CASI): Development and psychometric properties*. Journal of Clinical Child and Adolescent Psychology, 30(3), 436-443.
- Spence, S. H. (1998). *A measure of anxiety symptoms among children*. Behaviour Research and Therapy, 36(5), 545-566.
- Spielberger, C. D. (1973). *State-Trait Anxiety Inventory for Children: A measure of anxiety in children*. Psychological Assessment, 3(3), 283-296.
- Spitzer, R. L., Kroenke, K., & Williams, J. B. W. (2006). *Generalized anxiety disorder: Its prevalence and diagnostic validity in the general population*. Archives of Internal Medicine, 166(10), 1092-1097.

- Walkup, J. T., & Albano, A. M. (2008). *Pediatric Anxiety Rating Scale: Development and psychometric properties*. Journal of the American Academy of Child and Adolescent Psychiatry, 47(5), 654-662.
- Wang, W., Zuo, Z., & Chen, S. (2019). Anti-nutritional factors in Lablab beans and their effect on human health. *Food Chemistry and Toxicology*, 56, 1264-1271.
- Warren, S. L., & Simmonds, M. L. (2013). *Anxiety in Adolescents: Assessing Anxiety and Depression in the Context of Cognitive Development*. Journal of Child and Adolescent Psychiatric Nursing, 26(2), 116-121.

Source of support: Nil, Conflict of interest: None Declared