



Review Article

SIDDHA REVIEW ON PANDU (ANAEMIA) AND ITS MANAGEMENT

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ABSTRACT

Siddha system is a traditional system of medicine that originated in South India. It describes approximately 4,448 diseases affecting humans. *Pandu* (anemia) is considered as one of the disease in Siddha medicine, whereas modern medicine regards anaemia as a sign and symptom of many underlying diseases. Our aim to review the concept of *Pandu Roga* from various Siddha literatures and to correlate it with modern anaemia. Materials were collected from ancient Siddha texts, research journals, and electronic databases. Literature related to *Pandu* were reviewed from library of Faculty of Siddha Medicine, University of Jaffna and main library of Jaffna Municipal Council. Nine books were identified and included in this study. The collected data were processed and statistically analysed using simple statistical methods with Microsoft Excel 2016. Out of the nine Siddha literatures reviewed, five (55.55%) mentioned the causes of *Pandu*. According to the literature review, five (55.55%) books mentioned that improper habits and behaviour are major causes of *Pandu*. Among the ten types of *Pandu*, *Vatha Pandu* and *Pitha Pandu* were mentioned in 100% of the literatures. The primary cause of *Pandu* was identified as improper behavior and habits, along with unhealthy dietary practices.

INTRODUCTION

Siddha Medicine is one of the Traditional medical systems of Sri Lanka and is predominantly practiced in the Northern Eastern Provinces. Siddha medical literature describes 4,448 diseases that can affect the human body^[1]. According to traditional concepts, *Vatha*, *Pitha* and *Kapham* are the three fundamental functional principles (*Doshas*) governing physiological activities. Each individual possesses a unique balance of these *Doshas*, and health is defined as a state of equilibrium among them. In a healthy individual, the proportional ratio of *Vatha*, *Pitha*, *Kapham* is considered to be 1:1/2:1/4, respectively. Alterations in the balance of these functional units may occur due to unhealthy dietary patterns and lifestyle habits, leading to the manifestation of disease. The clinical presentation of *Pandu* in Siddha medicine can be correlated with anemia in modern medical science.

Anaemia is a major global public health problem, affecting approximately 1.62 billion people worldwide^[2]. It is defined as a condition in which the red blood cell count and haemoglobin concentration are lower than normal, resulting in an adequate oxygen carrying capacity to meet the physiological needs of the body^[3]. Synonyms, etiology, clinical features, classifications, and treatment modalities of *Pandu* have been described in Siddha literature. While certain literatures describe the synonyms, causes, and clinical manifestations in detail, others omit some of these components. The classification of *Pandu* also varies from one literature to another. Therefore, this review aims to analyze and summarize all available references with respect to the causes, clinical features, and classification methods of *Pandu*, which will help academicians, clinicians, and researchers to better understand the concept.

MATERIALS AND METHODS

Materials for this review were systematically collected from classical Siddha literatures, peer-reviewed research journals, and recognized electronic databases. The review integrates and synthesizes traditional Siddha principles with contemporary

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scientific interpretations to provide a comprehensive understanding of the subject.

Relevant Siddha literature that describes *Pandu* was systematically searched and retrieved from the Library of the Faculty of Siddha Medicine, University of Jaffna and the Main Library of the Jaffna Municipal Council. A total of nine Siddha classical texts were identified and included in this study. All selected texts were catalogued, listed, and tabulated. The extracted and tabulated data were subsequently analyzed using simple descriptive methods with Microsoft Excel 2016.

Nine Siddha books used for review were as follows,

1. *Pararajasekaram 6th part*
2. *Yoogi Vaithya Sinthamani*
3. *Noi Nadal Noi Mudhal Nadal Thiratu (Rendam Pagam)*
4. *Siddha Maruthuwam (Pothu)*
5. *Thanvandhiri Vaithiyam part-2*
6. *Sarabenthira Vaithiya Muraigal (Pandu, Kamalai)*
7. *Sikitchcha Rathna Theebam-2 (Vaithiya)*
8. *Jeevaratchamirdham*
9. *Aathmaratchamirdham (Vaithya Sara Sangiraham)*

Review of literature

Definition: The term *Pandu* literally denotes pallor. Clinically, this condition is characterized by pallor of the conjunctiva, tongue, and nail beds; hence, it is referred to as *Veluppu Noi* in Siddha medicine. Classical Siddha texts describe *Pandu* as a disorder involving the blood (*Uthiram*), arising due to the derangement of the humoral factors (*Mukkutram*), predominantly *Pitham*^[4]. The clinical features of *Pandu* show a close resemblance to anaemia as described in modern medicine.

According to the World Health Organization (WHO), anaemia is defined as a haemoglobin concentration of less than 120g/l in non-pregnant women aged 15 years and above, and less than 110g/l in pregnant women. In adult men, anaemia is defined as a haemoglobin concentration of less than 130 g/l^[5]. These diagnostic criteria support the correlation between *Pandu* described in Siddha medicine and anaemia in contemporary biomedical science.

Synonyms: A systematic review of classical Siddha literature identified four terms used synonymously to describe the condition corresponding to anaemia: *Venmai*, *Pandu*, *Venpandam*, and *Veluppu*. These terms collectively denote clinical features such as pallor of the skin and mucous membranes, which are comparable to the biomedical description of anaemia.

Premonitory symptoms of *Pandu*^[6]

1. Dietary indiscretions result in the vitiation of *Azhal*, which alters the colour and consistency of the blood. This disturbance impairs adequate tissue nutrition, leading to generalized pallor-an early clinical manifestation comparable to anaemia.

2. During the early stage, even mild physical activity such as walking a short distance produces dyspnea accompanied by weakness of the lower limbs, indicating reduced oxygen-carrying capacity of the blood.
3. Other prodromal features include anorexia, nausea, giddiness, transient blackouts, recurrent fainting episodes (syncope), palpitations, and gradual emaciation.

Clinical Features of *Pandu* (Anaemia)

Patients with *Pandu* commonly present with generalized weakness, headache, palpitations, giddiness, dyspnoea, anorexia, vomiting, and recurrent syncope.

Mucocutaneous manifestations such as pallor, skin atrophy, digital clubbing, fissured and erythematous tongue, and sore throat are also frequently observed.

Pandu: Symptom-Humoral Pathology Correlation (Siddha Pathophysiological Explanation)^[7,8]

Each clinical feature described under *Pandu* reflects a specific humoral imbalance according to Siddha pathology. This demonstrates a clear conceptual convergence between Siddha humoral theory and the clinical features of anaemia recognized in modern medicine.

1. Generalized weakness: Vitiated *Vatham* combined with reduced blood (*Azhal*) diminishes strength and bodily energy.
2. Headache: Excess *Vatham* in the cranial region causes tension and headache.
3. Palpitation: Imbalance of *Vatham* and altered blood properties disrupt cardiac rhythm.
4. Dizziness/Blackouts: Insufficient blood and *Vatham* disturbance reduce cerebral perfusion, causing transient loss of consciousness.
5. Syncope: Severe *Vatham* vitiation leads to episodic loss of consciousness.
6. Dyspnoea: *Vatham* disturbance affects the respiratory channels and oxygen delivery.
7. Pallor of skin: Reduced quality and quantity of blood causes visible pallor.
8. Skin dryness: Excess *Vatham*'s dry quality leads to skin shrinkage and dryness.
9. Digital clubbing: Long-standing blood deficiency and humoral imbalance affect nail and distal tissue health.
10. Fissure, erythematous, soft tongue: Reduced blood and excess *Vatham* disturb tongue structure and moisture.
11. Sore throat: Dryness and blood deficiency irritate pharyngeal mucosa, causing soreness.

Causes of *Pandu*^[9]

Out of the nine reviewed literatures, five (55.55%) reported on the causes of *Pandu*. Based on review of five literatures, 15 causative factors of *Pandu*

were identified. These causes were categorized into unhealthy diet, improper habits, and other contributing conditions. The following causes have been reported in five literatures.

Table 1: Causes of *Pandu* as Mentioned in the Literature

S.No	Categories of Causes of <i>Pandu</i>	Details of Causes of <i>Pandu</i>
1.	Unhealthy dietary practices	Excessive consumption of sour and salty foods, as well as over consumption of alkaline foods, can disturb humoral balance, particularly aggravating <i>Pitham</i> , leading to pallor and systematic weakness.
2.	Improper habits and lifestyle	Certain unhealthy behaviors and lifestyle practices have been reported to contribute to the development of <i>Pandu</i> . These include alcohol consumption, betel chewing, excessive daytime sleep, ingestion of soil (<i>Pica</i>), excessive sexual activity, and extreme physical exertion. Such practices are believed to disturb humoral equilibrium.
3.	Diseases	These include menorrhagia, dysentery, hemorrhoids, fever, intestinal parasitic infections, hematemesis, and hepatic disorders. Such diseases can lead to blood loss, nutrient depletion, and impairment of digestive and metabolic functions, which in turn vitiate <i>Pitham</i> , resulting in pallor, weakness, and systematic debility as described in classical Siddha texts.
4.	Imbalance of the three humors	Imbalance of the three humors- <i>Vatham</i> , <i>Pitham</i> , and <i>Kapam</i> –is considered a primary etiological factor in the development of <i>Pandu</i> .
5.	Other contributing factors	Additional factors that may contribute to the development of <i>Pandu</i> include prolonged fasting, poverty, and excessive mental stress or worrying. These conditions can lead to nutritional deficiency, depletion of blood, and disturbance of humoral balance, resulting in pallor, weakness, and systematic debility as described in classical Siddha texts.

Types of *Pandu*^[10,11]

Based on the present literary review, a total of 10 types of *Pandu* were identified from the nine classical texts reviewed.

Table 2: Classification of *Pandu* According to the Literature

S.No	Classification of <i>Pandu</i>	Main Characteristics of Each Type of <i>Pandu</i>
1.	<i>Vatha Pandu</i>	Body pain, tremors, fatigue, and dark discoloration of the urine and eyes.
2.	<i>Pitha Pandu</i>	Burning sensation, fever and yellow discoloration of urine and stool.
3.	<i>Sleththuma Pandu</i>	Body swelling, fatigue, and pallor of the skin, eyes, and face.
4.	<i>Thiridosha Pandu</i>	Fever, palpitations, and yellow discoloration of urine.
5.	<i>Miruthpakshana Pandu</i>	Pallor and fatigue
6.	<i>Visha Pandu</i>	Pallor, fatigue, thirst, dyspnoea, and body swelling.
7.	<i>Vathapitha Pandu</i>	Characteristics of Combined <i>Vatha</i> and <i>Pitha Pandu</i>
8.	<i>Pithasleththuma Pandu</i>	Characteristics of Combined <i>Pitha</i> and <i>Sleththuma Pandu</i>
9.	<i>Moola Pandu</i>	Dryness, pallor, weakness, and body swelling.
10.	<i>Pithamoola Pandu</i>	Headache, pallor, body swelling, back pain, and hoarseness of voice.

According to *Sarabenthira vaithya murai*, *Pararajasekaram* (6th part) and *Pandu Rogam* is classified into five types^[12,13]. The types described are:

• ***Vatha Pandu***: This type occurs when *Vatha* is aggravated due to improper diet and lifestyle, leading to the onset of *Pandu Roga*.

Symptoms: *Vatha Pandu Roga* emerges as symptoms including the following: a transformed taste in the

tongue, swelling, body aching, pricking pain, tremors, pain in the abdomen, headache, and dryness of feces.

• ***Pitha Pandu***: In individuals with a *Pitha Prakriti*, consuming foods and activities that provoke *Pitha Dosha* can lead to its vitiation, which in turn affects the *Rasa*(fluid), *Raktha* (blood), and *Mamisa* (muscle) tissues, causing *Pitha Pandu*.

Symptoms: Yellowish-green complexion, burning fever, thirst, fainting, intense thirst, yellow urine, and excessive perspiration generating a desire for cooling purposes, pleasing food, bitter taste in the mouth, sour belching, feeling of burning, bad breath, transformed stools, sickness

• **Kapha Pandu:** This type occurs when *Kapha Dosha* is aggravated due to improper diet and lifestyle, leading to the vitiation of *Kapha* and causing *Kapha Pandu*.

Symptoms: body heaviness, sluggishness or sleepiness, vomiting, pale appearance, excessive salivation, shaking, passing out or unconsciousness, wooziness or feeling lightheaded, fatigue, breathing obstacles, cough, sluggishness, a lack of taste or appetite, aversion for hot, spicy, and dry foods, inflammation, sweet taste, These symptoms, often approach anemia, are the outcome of a *Kapha dosha* imbalance which influences the body's physiology, especially with the context of the generation and quality of blood^[14].

• **Sannipatha Pandu:** This form occurs when all three *doshas* (*Vatha*, *Pitha*, and *Kapha*) are simultaneously aggravated due to improper diet and lifestyle, leading to a condition that shows symptoms of all three types of *Pandu*. *Sannipatha Pandu Roga* is a complex form of anemia produced by an imbalance of the three *doshas* (*Vatha*, *Pitha* and *Kapha*) as a consequence of inadequate food. All three *doshas* get worse when nutrition recommendations are neglected. *Sannipatha Pandu Roga*, a severe and elaborate version of the disease, is the outcome. Due to the intricacy of the imbalances involved, the illness is exceptionally challenging to tolerate and cure since it manifests symptoms from all three *doshas*. Furthermore, it gets more complex^[15].

• **Mridabhakshana Pandu:** This type of *Pandu* as being caused by the consumption of soft or clay-like substances. Ingesting mud on frequently or implementing clay contaminated objects might upset the *vatha*, *pitha*, and *kapha dosha* harmony.

Classification of anemias^[16, 17]

A. Pathophysiologic

1. Anaemia due to increased blood loss

- a) Acute post-haemorrhagic anaemia
- b) Chronic blood loss

2. Anaemias due to impaired red cell production

- a) Cytoplasmic maturation defects
 1. Deficient haem synthesis: Iron deficiency anaemia
 2. Deficient globin synthesis: Thalassaemic syndromes
- b) Nuclear maturation defects Vitamin B12 and/or folic acid deficiency: Megaloblastic anaemia.
- c) Defect in stem cell proliferation and differentiation
 1. Aplastic anaemia

2. Pure red cell aplasia

d) Anaemia of chronic disorders

- e) Bone marrow infiltration
- f) Congenital anaemia

3. Anaemias due to increased red cell destruction (Haemolytic anaemias)

- A. Extrinsic (extracorporeal) red cell abnormalities
- B. Intrinsic (intracorporeal) red cell abnormalities

B. MORPHOLOGIC

1. Microcytic, hypochromic
2. Normocytic, normochromic
3. Macrocytic, normochromic

Samprapthi (Pathogenesis) of Pandu Roga:

The *Samprapthi* (pathogenesis) of *Pandu Roga* is explained based on the vitiation of *Doshas* and *Dhatu*s as described in classical Ayurvedic texts^[18].

Consumption of various etiological factors (*Nidana*) leads to disturbance in the equilibrium of the *Doshas*, predominantly *Pitha*. The *Pitha* situated in the *Hridaya* (heart), particularly *Sadhaka Pitta* becomes aggravated. Due to the forceful action of *Vatha*, this vitiated *Pitha* is expelled from the *Hridaya* and enters the *Dasha Dhamanis* (ten major vessels connected to the heart). From there, it circulates throughout the body.

As the aggravated *Pitha* spreads systemically, it vitiates *Kapha* and *Vatha* along with *Asrik* (blood), *Twak* (skin), and *Mamsa* (muscle tissue). The vitiation of these *Doshas* and *Dhatu*s results in impaired nourishment and altered metabolism, leading to characteristic changes in skin complexion. Clinically, this manifests as abnormal discolourations such as *Pandu* (pallor), *Haridra* (yellowish discolouration), and *Harita* (greenish discolouration).

- Thus, the cardinal features of *Pandu Roga*, including pallor and associated symptoms, are produced due to the imbalance and pathological interaction of *Doshas* and *Dhatu*s, with *Pitha* playing a primary role in the disease process. *Samprapthi Ghataka* (Factors of Pathogenesis) in *Pandu Roga*

The pathogenesis of Pandu Roga involves the following key factors:

1. *Dosha: Pitha* is the primary *Dosha* involved in *Pandu Roga*. However, all three *Doshas* participate in the disease process, making it a *Tridosha* condition.
 - *Pitha*: Specifically, the *Sadhaka*, *Ranjaka*, and *Bhrajaka* subtypes of *Pitta* are predominantly affected.
 - *Kapha*: The *Avalambaka* and *Kledaka* subtypes of *Kapha* are involved.
 - *Vata*: The *Vyana Vayu* and *Samana Vayu* are disturbed, contributing to the progression of the disease.

2. *Dushya*: The disease affects the following *Dushyas* (tissues):

- *Twaka* (skin)
- *Rasa* (plasma/bodily fluids)
- *Rakta* (blood)
- *Mamsa* (muscle tissue)
- *Meda* (adipose tissue)

3. *Strothas* (body channels)

The following *Srothas* (body channels) are involved in *Pandu Roga*:

- *Rasavaha Strotas*
- *Raktavaha Strotas*
- *Srothodushti*: The pathological changes in the *Srothas* include *Sanga* (obstruction) and *Vimarga Gamana* (abnormal movement of *Doshas* in improper channels).

4. *Agni* (digestive fire)

- *Jatharagni* (digestive fire) is impaired.
- *Dhatvagni* (tissue metabolic fire) is also weakened.

5. *Agni Dushti*: Due to the impairment of *Agni*, *Mandagini* (reduced digestive capacity) occurs, leading to improper digestion and metabolism, which plays a crucial role in the pathogenesis of *Pandu Roga*.

- *Udbhavasthana* (Site of Origin): The disease originates in the *Amashaya* (stomach).
- *Adhishthana* (Primary Site of Manifestation): The primary sites of manifestation are *Twaka* (skin) and *Mamsa* (muscle tissue), involving both internal and external structures.
- *Vyakta sthana* (Site of Clinical Manifestation): Clinically, the disease becomes evident on the *Twak* (skin), presenting with characteristic discoloration and other visible features.
- *Sanchara Sthana* (Sites of Spread): The disease spreads through the *Twaka* (skin) and *Mamsa* (muscle tissues).
- *Svabhava* (Nature of Disease): *Pandu Roga* is *Chirakari* in nature, indicating a chronic and persistent disease course.

6. The detailed *Samprapti Ghataka* explains the involvement of *Doshas*, *Dhusyas*, *Srotas*, *Agni*, and sites of origin, manifestation, and spread in the development and progression of *Pandu Roga*. The interaction of impaired digestion, metabolic dysfunction, and tissue involvement leads to the classical clinical features of the disease.

Chikitchai (Treatment) for *Pandu Roga*^[19]

To restore the deranged physiological state to normalcy, purgative medicines should be administered initially. Subsequently, drugs that stimulate the digestive fire (appetite), enhance proper digestion of the consumed food, and promote the vitality and strength of the blood should be prescribed.

The therapeutic intervention is systematically administered in three consecutive stages, encompassing preparatory stages, primary treatment, and post-therapeutic management to ensure comprehensive disease control and prevention of recurrence.

1. First Phase (Preparatory stage)

This is a preparatory phase of treatment. During this phase, purgation therapy is generally administered to normalize the vitiated *Vali* humoral imbalance. It also aids in the elimination of intestinal worms and the removal of accumulated toxins from the body. The following formulations are commonly prescribed.

Therapy 1

1. *Vitis vinifera* - *Thiratchai* (Grape)
2. *Phoenix dactylifera* - *Pereichu* (Date fruit)
3. *Rosa borboniana* - *Rosa poo* (Rose)

4. *Operculina turpethum* - *Sivathai* (Dill seed)- Equal quantities of all the above ingredients are boiled in water and reduced to one-eighth of the original volume. The decoction is administered at bedtime. This formulation helps in cleansing the gastrointestinal tract (GIT) and detoxifying the body.

Therapy 2

1. *Sesbania grandiflora* - *Agati*

Ten to fifteen grams of fresh leaves are boiled in 250ml of water and reduced to one-eighth (approximately 30ml). The decoction is administered with palm jaggery bedtime. This therapy is effective in cleansing the gastrointestinal tract and expelling intestinal worms.

Therapy 3

1. *Tinospora cordifolia* - *Seenthil* (Heart-leaved Moonseed)
2. *Feronia limonia* - *Narivila*
3. *Mollugo cerviana* - *Parpadagam*
4. *Cassia acutifolia* - *Perungalli*
5. *Operculina turpethum* - *Sivathai* ^[20]

Equal quantities of the above -mentioned ingredients are taken, and a decoction is prepared using a sufficient quantity of Epsom salt. This formulation is effective in cleansing the gastrointestinal tract and the hepato-biliary system by inducing therapeutic purgation.

Second Stage (Primary treatment)

This phase includes the selection of medicines, dosage, vehicles (*Anupanam*), adjuvants (*Thunai marunthu*), duration of therapy, and dietary prescription. The Siddhars' clinical insight was highly advanced; their prescriptions comprised herbal, herbo-mineral, and metallic formulations rich in micro-and macronutrients such as calcium, vitamin c, zinc, and iron. The traditional Siddha approach to the

management of anaemia aligns closely with modern therapeutic principles.

The following drugs are generally prescribed in the treatment of anaemia, along with suitable vehicles (*Anupanam*) and adjuvants (*Thunai marunthu*).

Table 3: Siddha Formulations with Ingredients and Therapeutic Applications

S.No	Formulations	Ingredients	Indications	References
1.	<i>Mandoorathy adai kudineer</i>	1.Manduram (Ferric oxide) 2.Sengal kittam (Red brick powder) 3.Other medicinal herbs	Used to elevate iron content in blood.	[21]
2.	<i>Thirikadugu choornam</i>	1.Piper nigrum (black pepper) 2.Piper longum (long pepper) 3.Zingiber officinale (ginger)	Used to treat pallor due to intestinal helminth infestation.	[22]
3.	<i>Panchatheebakini choornam</i>	1.Piper nigrum (black pepper) 2.Zingiber officinale (ginger) 3.Piper longum (long pepper) 4.Elettaria cardamomum (cardamom) 5.Cuminum cyminum (cumin)	Used to treat anorexia condition.	[23]
4.	<i>Thiripala maathirai</i>	1.Terminalia chebula (chebulic myrobalan) 2.Terminalia bellirica (belleric myrobalan) 3.Phyllanthus emblica (indian gooseberry)	Used to elevate haemoglobin level in blood.	[24,25]
5.	<i>Madhulai manappaahu</i>	1.Punica granatum (Pomegranate) 2.Thanen (Honey) 3.Panneer (Rose water) 4.Kalkandu (Sugar kandy)	Used to treat anaemia condition.	[26,27]
6.	<i>Annabethi chendhuram</i>	1.Purified Annabethi (ferrous sulphate) 2.Lemon juice	Used to elevate iron level in the body and specially for iron deficiency anaemia.	[28]
7.	<i>Aya chendhuram</i>	1.Purified iron filings 2.Vinegar 3.Odina (<i>Odina wooider</i>) bark juice	Used to treat anaemia.	[29]
8.	<i>Aya veeriya kaantha chendhuram</i>	1.Purified Kaantham (Magnetic oxide of Iron) 2.Thara leaf juice (<i>Mollugo oppositifolia</i> Linn.,)	Used to elevate haemoglobin level.	[30,31]
9.	<i>Aya Bringaraja Karpam</i>	1.Suthi seitha Ayapodi (Purified iron filings) 2.Suthi seitha Mandooram (Purified dross iron) 3.Karisalai saru (<i>Eclipta</i> juice) 4.Elumicham pazha saru (Lime juice)	Used to treat iron deficiency anaemia.	[32]
10.	<i>Vallarai nei</i>	1. <i>Centella asiatica</i> (<i>vallarai</i>) 2. <i>Tinospora cordifolia</i> (<i>seenthil</i>) 3.Other medicinal herbs 4.Nei (Ghee)	Used to elevate haemoglobin level in blood.	[33,34]
11.	<i>Thasadeepakkini Chooranam</i>	1. <i>Ferula asafoetida</i> (<i>Perungayam</i>) 2. <i>Acorus calamus</i> (<i>Vasambu</i>) 3. <i>Embelia ribes</i> (<i>Vaividangam</i>) 4. <i>Trachyspermum ammi</i> (<i>Omam</i>)	Used to treat anaemia	[35,36]

		5. <i>Terminalia chebula</i> (Kadukkaī) 6. <i>Plumbago zeylanica</i> (Chithramoolam) 7. Rock salt (Induppu) 8. <i>Saussurea costus</i> (Kostam) 9. <i>Piper longum</i> (Thippili) 10. <i>Cuminum cyminum</i> (Seerakam)		
12.	Arithagi kirutham	1. <i>Terminalia chebula</i> (chebulic myrobalan) 2. <i>Bunium persicum</i> (Wild Cumin) 3. <i>Phyllanthus emblica</i> (Gooseberry) 4. <i>Cassia fistula</i> (Indian Laurus) 5. <i>Glycyrrhiza glabra</i> (Licorice) 6. Ghee	Used to treat anaemia	[37]

Third phase (Post therapeutic management)

This phase follows immediately after the completion of treatment and emphasizes lifestyle modification. It includes the prescription of *Iyamam* and *Niyamam* (daily regimen), seasonal regimens, and regulated dietary practices, with the objective of maintaining health and preventing the recurrence of disease^[38].

RESULTS AND DISCUSSION

RESULTS

Table 4: Categories of Causes of *Pandu* and Their Frequency of Mention in Reviewed Siddha Literatures.

S. No	Categories of causes of <i>Pandu</i>	Mentioned in No. of Literatures
1.	Improper habits and lifestyle	5
2.	Unhealthy dietary practices	4
3.	Diseases	2
4.	Imbalance of the three humors	1
5.	Other contributing factors	2

Out of the nine reviewed literatures, five (55.55%) reported on the causes of *Pandu*. Analysis of the five reviewed Siddha literatures revealed that the causes of *Pandu* could be categorized into five major groups (Table 1). The most frequently cited category was Improper habits, mentioned in 5 out of 5 literatures (100%), followed by unhealthy diet, reported in 4 literatures (80%). Diseases and other contributing factors were each mentioned in 2 literatures (40%), while Imbalance of humors was cited in only one literature (20%).

The pie chart (Fig.1) illustrates the proportional distribution of causes of *Pandu* as reported across five selected literatures. Among the identified etiological categories, improper habits constituted the largest share, accounting for 36%, indicating that lifestyle-related factors were the most frequently reported contributors to *Pandu*. This was followed by unhealthy dietary practices, which represented 29%, highlighting the significant role of nutritional inadequacy and improper food intake.

Diseases such as chronic illnesses and conditions associated with blood loss contributed 14% of the reported causes. Similarly, other contributing factors, including fasting, poverty, and psychological stress, also accounted for 14%. The least reported category was imbalance of the three humors (*Vatham*, *Pitham*, *Kapham*), comprising 7% of the total.

Table 5: Literature-Based Classification of *Pandu* According to the Number of References

S.No	Classification of <i>Pandu</i>	Mentioned in No. of Literatures
1.	<i>Vatha Pandu</i>	9
2.	<i>Pitha Pandu</i>	9
3.	<i>Sleththuma (Kapha) Pandu</i>	8
4.	<i>Tridhoshha Pandu</i>	8
5.	<i>Visha Pandu</i>	5
6.	<i>Mruthpakshana Pandu</i>	5
7.	<i>Vathapitha pandu</i>	1

8.	<i>Pithaslethuma pandu</i>	1
9.	<i>Pithamoola pandu</i>	1
10.	<i>Moola pandu</i>	1

A total of nine classical Siddha literatures were reviewed to identify the types of *Pandu*. The frequency of occurrence of each type across the literatures is summarized in Table 5.

Vatha Pandu and *Pitha Pandu* were reported in all nine literatures (100%). *Sleththuma Pandu* and *Thirithosha Pandu* were documented in eight literatures each (88.88%). *Mruthpakshana Pandu* and *Visha Pandu* were identified in five literatures each (55.55%). Less frequently reported types, including *Vathapitha Pandu*, *Pithaslethuma Pandu*, *Pithamoola Pandu* and *Moola Pandu*, were each mentioned in one literature (11.11%).

The distribution (Fig.2) of various types of *Pandu* reported across nine classical Siddha literatures is illustrated in Figure 2. *Vatha Pandu* and *Pitha Pandu* were the most frequently described types, each accounting for 19% of the total references. *Sleththuma Pandu* and *Thiridhosha Pandu* contributed 17% each. *Mruthpakshana Pandu* and *Visha Pandu* were reported in 10% of the literatures, while the remaining types – *Vathapitha Pandu*, *Pithaslethuma Pandu*, *Pithamoola Pandu*, and *Moola Pandu*—each constituted 2% of the total (Figure 2).

DISCUSSION

The findings (Fig.1) suggest that lifestyle-related factors including habitual behaviors and dietary practices, play a predominant role in the etiology of *Pandu* according to classical Siddha texts. Improper habits, such as alcohol consumption, betel chewing, lack of routine, or neglect of personal care, were the most frequently reported contributors, highlighting the significance of daily conduct (*Niyamam*) and behavioral regulation in maintaining health. Dietary factors, including insufficient or imbalanced nutrition, were also emphasized, reinforcing the Siddha perspective that proper nutrition is central to the prevention of pallor-related conditions.

Interestingly, the imbalance of humors (*Vatham*, *Pitham*, *Kapham*) was cited in only 7% of the literatures, suggesting that while humoral theory remains foundational in Siddha medicine, practical

lifestyle and dietary factors may have been considered more immediately observable causes of *Pandu*.

Overall, these findings underscore a multifactorial understanding of *Pandu* in Siddha medicine, with a predominant focus on modifiable lifestyle and dietary factors, which aligns with contemporary preventive strategies for anaemia.

The present analysis (Fig.2) demonstrates that *Pandu* is predominantly described as a disorder involving derangement of *Vatham* and *Pitham*, as evidenced by the universal reporting of *Vatha Pandu* and *Pitha Pandu* across all reviewed Siddha texts. This consistent documentation highlights the central role of impaired digestion, altered metabolism, and defective tissue nourishment in the pathogenesis of *Pandu*.

The high prevalence of *Sleththuma Pandu* and *Thirithosha Pandu* further suggests that chronicity of the disease may lead to the involvement of *Kapham* and, eventually, all three humors. *Mruthpakshana Pandu* underscores the importance of dietary inadequacy and improper food habits. Overall, the Siddha classification of *Pandu* offers a comprehensive and holistic framework that encompasses humoral imbalance, dietary factors, toxic influences, and disease chronicity.

CONCLUSION

Among the nine classical Siddha literatures reviewed, ten distinct types of *Pandu* were identified, with *Vatha Pandu* and *Pitha Pandu* being reported in all literatures, highlighting their universal recognition and clinical significance. Analysis of etiological factors revealed five major causes contributing to the development of *Pandu*, among which improper habits and unhealthy dietary practices were more frequently cited. These findings emphasize that humoral imbalance, particularly involving *Vatham* and *Pitham*, in combination with modifiable lifestyle and nutritional factors, constitutes the principal basis of *Pandu* in Siddha medicine. The results provide a systematic framework for understanding the disease and support the formulation of preventive and therapeutic strategies targeting both humoral regulation and lifestyle modification.

FIGURES

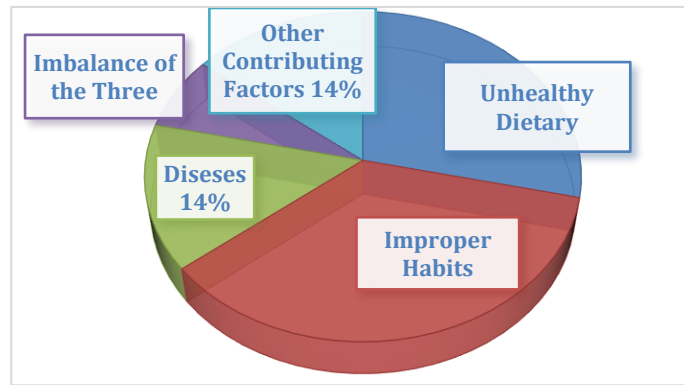


Figure 1: Literature-Based Distribution of Causes of Pandu Across Five Types with Their Percentages

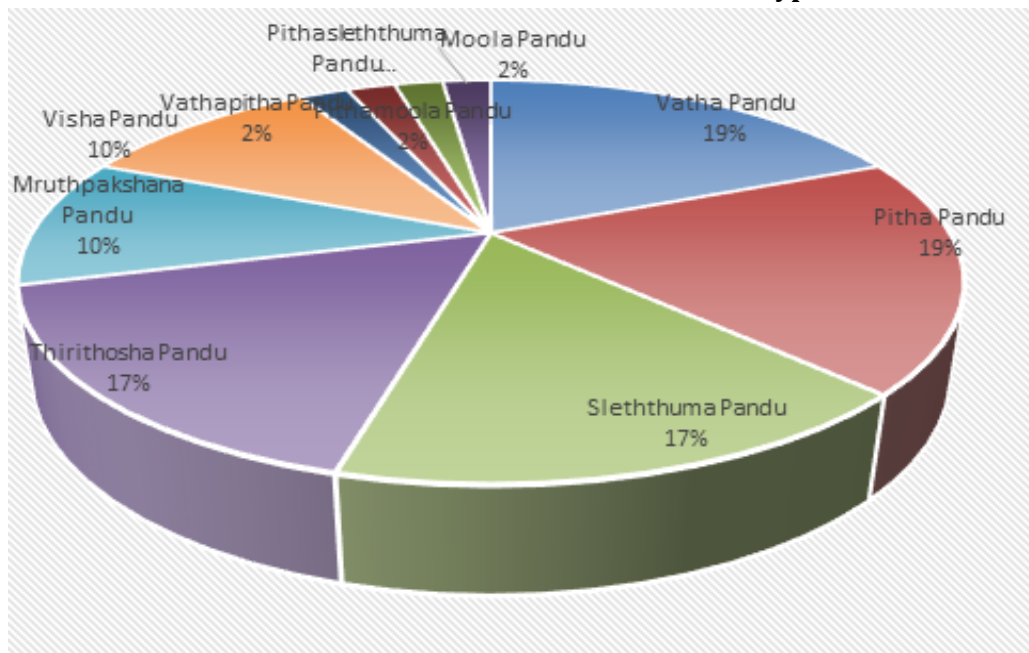


Figure 2: Percentage Distribution of Various Types of Pandu Reported Across Nine Classical Siddha Literature

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