

Food cravings, disordered eating behaviour and alcohol abuse in *Bhutonmadas* - An exploratory review

Abstract

Various psychiatric and neuropsychiatric conditions are described under a broad disease entity called *Unmada* in *Ayurvedic* classical texts. *Bhutonmada* or *Grahonmada* is a specific type of *Unmada* that has multiple phenotypic clinical presentations. *Bhutonmada* is multifactorial, heterogeneous, and idiopathic in nature. Different types of food cravings, abnormal eating behaviours and alcohol abuse related symptoms are mentioned in the literature of *Bhutonmada*. The present study is aimed to explore and analyze the clinical features of *Bhutonmada* related to food cravings, abnormal eating behaviours and alcohol abuse with the help of literature based on contemporary nutritional psychiatry. *Abhipraayam*, *Ruchim*, *Priyam*, *Ratim*, *Sakta Drishtim* and *Yachinam* are the various terms quoted in the context of *Bhutonmada*, represents variability of food cravings depend upon various factors such as intensity, frequency, quality, mood, inter-individual, and socio-cultural. Various abnormal or disordered eating behaviours such as hypophagia (*Alpaahaara*), hyperphagia (*Bahvaashinam/Bahu Bhuk/ Bahusha Yachantam*), emotional eating (*Lolam*), binge eating (*Annapaana Ratim*), strange eating habits (*Bhramad Bhojinam*) etc are mentioned in *Bhutonmada* literature. Appetite abnormalities such as *Anannabhilasha*, *Arochaka*, *Na Kshuda*, *Kshudaatura* etc manifests into either excessive (*Bahvaashinam/ Bahu Bhuk*) or low food consumption (*Alpaahaara/Anna Dveshinam*) are also described in the *Bhutonmada* context. Terms such as *Abhiprayam*, *Ruchim*, *Priyam*, *Ratim* and *Sakta Drishtim* pertaining to alcohol use/abuse in *Bhutonmada* could possess different contextual meanings. The present exploratory review will provide various new insights and better understanding of the terminology related to food cravings, eating disorders and alcohol use disorders in *Bhutonmada* and paves the way for the development of questionnaires and dietary or nutritional guidelines in the diagnostic and/or management protocols of *Bhutonmada*.

Keywords: alcohol use disorder, *ayurveda*, *bhutonmada*, eating disorders, *grahonmada*, *unmada*

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Introduction

Ayurveda is an ancient medical system of India that has been in practice since several centuries. *Bhuta Vidya* could be considered as *Ayurvedic* psychiatry and it is one among the eight specialities of *Ayurveda* that deals with the diagnosis and management of psychiatric disorders. Most of the psychiatric conditions are clubbed under a broad disease entity called *Unmada* in *Ayurvedic* classical texts. Abnormalities across various domains such as perception, cognition, orientation, memory, personality, psychomotor activity, behaviour etc could be seen in the patients of *Unmada*. *Bhutonmada* or *Grahonmada* is a specific type of *Unmada* that occurs due to the affliction of some invisible entities called *Bhuta* or *Graha*. *Bhuta* or *Graha* denote either microbes or various supernatural entities. *Bhutonmada* denote heterogeneous, multifactorial psychiatric or neuropsychiatric disorders having idiopathic origin with broad range of clinical manifestations. There is a diversity of opinion among various *Ayurvedic* scholars regarding the classification of *Bhutonmada*. Previous works have compared *Bhutonmadas* or *Grahonmadas*' with various psychiatric and neuropsychiatric conditions.¹

Nutritional psychiatry is an emerging discipline that deals with the relationship between dietary patterns and mental health disorders.² Diet and nutrition have significant effects on mood and mental health.³ Disturbed eating behaviours could be seen in various psychiatric illnesses. Altered appetite, hunger and/or food cravings are seen in patients with psychosis spectrum disorders.⁴ Craving towards specific

foods could be seen in the description of various *Bhutonmadas*. Alcohol abuse and a wide variety of abnormal eating behaviour patterns are also present along with food cravings among various *Bhutonmadas*⁵⁻²⁰ that have not been explored till date. The present study is aimed to explore specific clinical features of *Bhutonmada* such as food cravings, abnormal eating behaviours and alcohol abuse with the help of contemporary literature on nutritional psychiatry. The present exploratory review will provide various new insights into the development of dietary or nutritional guidelines in the management protocols of *Bhutonmada*.

Review methodology

We have conducted literature search in different databases and search engines including Web of science, Scopus, PubMed, EMBASE, and Google Scholar with various key words related to *Ayurveda* and contemporary prognostic literature on wounds. We did not consider any time limitations but articles or abstracts published in English language only were considered during database searching. *Sushruta Samhita* with *Nibandha Sangraha* and *Bhanumati* commentary and other *Ayurvedic* texts such as *Charaka Samhita*, *Ashtanga Samgraha*, *Ashtanga Hrudaya*, *Bhela Samhita*, and *Kashyapa Samhita* have been referred. Published articles that failed to describe the factors of interest for the present study were excluded. Articles that are having either contradicting or supportive findings to the present work have been included. Obtained data is compiled, interpreted and presented as a narrative review.

Discussion

Unmada is an umbrella term explained in *Ayurvedic* classical texts that incorporates various psychiatric and/or neuropsychiatric conditions. It is characterized by the derangement across various psychopathological domains such as *Manas* (perception), *Buddhi* (cognition), *Samjna Jnana* (orientation), *Smriti* (memory), *Bhakti* (interests or desires), *Sheela* (personality), *Cheshtha* (psychomotor activity or behavior), and *Achara* (conduct or socio-cultural factors). *Vataja*, *Pittaja*, *Kaphaja*, *Sannipataja* and *Agantuja* are the five types of *Unmada*. *Bhutonmada*, *Grahonmada* and *Agantuja Unmada* are synonymous and they represent a specific type of *Unmada* that is caused by invisible entities known as *Bhuta* or *Graha*.¹⁸ *Bhuta* or *Graha* are synonymous and they may represent demons or evil spirits or microbes or idiopathic psychopathological entities. *Bhuta*'s afflict the person with either one of the three intentions i.e., *Himsa* (violence), *Rati* (desire) and *Abhyarchana* (worship). Causative factors are untraceable in *Bhutonmada*. *Karma* (consequences of bad deeds of past and present life) and *Prajnaparadha* (cognitive errors) play an important role in the manifestation of *Bhutonmada*. *Chidra Kaalas* are the specific traumatic and stressful times make the person vulnerable to get afflicted by the *Bhutas*. *Chidra Kaalas* could be considered as the precipitating factors for *Bhutonmada*.¹

Bhutonmada is characterized by abnormality across various domains such as energy levels, risk taking behavior, perception, memory, speech, evaluation of self and environment etc. *Acharya Sushruta* has described 8 types of *Bhutonmada* (*Deva*, *Gandharva*, *Yaksha*, *Asura*, *Uruga*, *Pitru*, *Rakshasa*, and *Pishacha*). Eleven types of *Bhutonmada* are described by *Acharya Charaka* (*Deva*,

Guru Rishi Vriddha & Siddha, *Pitru*, *Yaksha*, *Gandharva*, *Rakshasa*, *Brahma Rakshasa*, and *Pishacha*). In *Ashtanga Hridaya*, 18 types of *Bhutonmada* are mentioned (*Deva*, *Asura*, *Rishi Guru Vriddha & Siddha*, *Gandharva*, *Pitru*, *Yaksha*, *Rakshasa*, *Brahma Rakshasa*, *Uruga*, *Pishacha*, *Kushmanda*, *Preta*, *Nishada*, *Maukirana*, and *Vetala*). *Bhutonmadas* are innumerable in number, heterogenous, multifactorial and idiopathic in nature. Clinical phenotypes, course and prognosis of *Bhutonmada* are widely variable depending upon various factors such as intensity of *Karma* or *Prajnaparadha* and/or intention and type of *Bhuta* causing *Bhutonmada*.¹⁶

Clinical features of various *Bhutonmadas* explained in *Ayurvedic* classical texts have shown similarity to different psychiatric and neuropsychiatric illnesses.⁵⁻²⁰ Craving towards specific foods (Table 1), abnormal or disordered eating behaviours (Table 2) and alcohol abuse or misuse (Table 3) are the common clinical findings across *Bhutonmadas*. Significance of their presence, manifestation, causes for their sustenance and their role in prognosis are still unknown. Nutritional Psychiatry is a new field of research that deals with the role of nutrition and diet in mental health. Quality of individuals' diets is related to the risk for mental disorders. Unhealthy dietary habits are positively associated with mental disorders. The immune system, brain plasticity, oxidative biology, and the microbiome-gut-brain axis are the known biological pathways that mediate the relationships between nutrition, diet and mental health.²¹ Exploring the manifestation, sustenance and significance of food cravings, eating disorders and alcohol abuse of *Bhutonmadas* with the help of contemporary Nutritional psychiatry literature has been done in the following sections.

Table 1 *Bhutonmadas* and specific food cravings

| Type of <i>Bhutonmada</i> / <i>Unmada</i> | Relevant contemporary psychiatric / neuropsychiatric conditions | Craving towards specific foods |
|---|---|--|
| <i>Deva Grahonmada</i> | Interictal behaviour syndrome of temporal lobe epilepsy (TLE); Obsessive compulsive disorder (OCD) with mania; | <i>Dadhi & Ksheera Abhipraayam</i> ; |
| <i>Asura Grahonmada</i> | Antisocial personality disorder (ASPD); Narcissistic personality disorder (NPD); Borderline personality disorder (BPD); | <i>Amisha Ruchim</i> or <i>Priyam</i> ; |
| <i>Pitru Grahonmada</i> | Vitamin B ₁₂ deficiency-induced neuropsychiatric manifestations; | <i>Tila</i> , <i>Guda</i> , <i>Maamsa</i> , and <i>Paayasa Priyam</i> ; |
| <i>Yaksha Grahonmada</i> | Bipolar disorder with OCD; | <i>Amisha Priyam</i> ; |
| <i>Rakshasa Grahonmada</i> | ASPD with psychotic mania; | <i>Rakta</i> and <i>Amisha Priyam</i> ; |
| <i>Uruga Grahonmada</i> | Extrapyramidal movement disorder; Tourette syndrome - plus; | <i>Ksheera</i> , <i>Ghrita</i> , <i>Guda</i> , and <i>Madhu Priyam</i> ; |
| <i>Pishacha Grahonmada</i> | Frontotemporal dementia (FTD) with vitamin B ₁₂ deficiency; | <i>Maamsa Ratim</i> ; |
| <i>Nishada Grahonmada</i> | Behavioral and psychological symptoms of dementia (BPSD); FTD; Hebephrenia; | <i>Tilaanna & Maamsa Sakta Drishtim</i> ; |
| <i>Virupaksha Grahonmada</i> | FTD; Dementia; Psychosis; ASPD; | <i>Ama Maamsa Palala Mulaka Apupa Paramaanna Yachinam</i> ; |

Table 2 *Bhutonmadas* and abnormal eating behaviour patterns

| Type of <i>Bhutonmada</i> / <i>Unmada</i> | Relevant contemporary psychiatric / neuropsychiatric conditions | Abnormal eating behaviour pattern |
|---|--|---|
| <i>Deva Grahonmada</i> | Interictal behaviour syndrome of temporal lobe epilepsy (TLE); Obsessive compulsive disorder (OCD) with mania; | <i>Bhojana Anabhilaashinam</i> |
| <i>Pitru Grahonmada</i> | Vitamin B ₁₂ deficiency-induced neuropsychiatric manifestations; | <i>Anannabilasha</i> ; <i>Arochaka</i> |
| <i>Yaksha Grahonmada</i> | Bipolar disorder (BD) with OCD; | <i>Annapaana Ratim</i> |
| <i>Rakshasa Grahonmada</i> | Anti social personality disorder (ASPD) with psychotic mania; | <i>Anna Dveshinam</i> |
| <i>Pishacha Grahonmada</i> | Frontotemporal dementia (FTD) with vitamin B ₁₂ deficiency; | <i>Bahvaashinam</i> ; <i>Lolam</i> ; <i>Kshudhadhikam</i> ; |
| <i>Preta Grahonmada</i> | Catatonia; | <i>Ahaaradveshinam</i> |
| <i>Maukirana Grahonmada</i> | Graves' hyperthyroidism; Graves' ophthalmopathy; | <i>Yaachantam Annam</i> and <i>Udakam</i> |
| <i>Yagnasena Grahonmada</i> | BD; Mania; | <i>Bahusha Toyam Yachayantam</i> |

Table Continued...

| Type of Bhutonmada / Unmada | Relevant contemporary psychiatric / neuropsychiatric conditions | Abnormal eating behaviour pattern |
|---------------------------------|--|---------------------------------------|
| Nistejasa Grahonmada | FTD; Schizophrenia; | Bahvaashinam; Bhramaad Bhojinam |
| Kubera or Yaksharaat Grahonmada | Mania; | Kshudaatura |
| Grahaka Grahonmada | Catatonia; Major depressive episode; Negative symptoms of Schizophrenia; | Na Kshudha; Na Trishaarta; |
| Pittaja Unmada | Hyperthyroidism with mania; Psychotic mania; Irritable mania; | Bahu Bhuk; Trishna Bahula; |
| Kaphaja Unmada | Myxedema psychosis; | Anannabhilasha; Arochaka; Alpaahaara; |

Table 3 Bhutonmadas and Alcohol abuse

| Type of Bhutonmada | Alcohol abuse |
|----------------------|------------------------|
| Deva Grahonmada | Sura Abhipraayam; |
| Asura Grahonmada | Sura Ruchim or Priyam; |
| Gandharva Grahonmada | Paana Ratim; |
| Yaksha Grahonmada | Madya Priyam; |
| Rakshasa Grahonmada | Madya Priyam; |
| Pishacha Grahonmada | Madya Ratim; |
| Nishada Grahonmada | Madya Sakta Drishtim; |

Food cravings & Bhutonmada

A food craving is an intense desire to eat a specific type of food.²² Craving is defined as a strong urge, desire or wanting.²³ Food craving is defined as an intense and specific desire to consume a certain type of food that is difficult to resist.²⁴ Food craving is a multidimensional experience as it includes emotional (e.g., desire to eat or changes in mood), cognitive (e.g., thinking about food), behavioral (e.g., consuming and seeking food), and physiological (e.g., salivation) aspects.²⁵ Diet-induced cravings may be mediated by physiological (e.g., nutritional deprivation) or psychological (e.g., ironic effects of food thought suppression) mechanisms. Selective food deprivation might increase cravings for the avoided foods. The relationship between food restriction and food craving is extremely complex. Situational factors and inter-individual differences might play a role in the relationship between craving and consumption. Pavlovian conditioning, cognitive models, restrained eating, actual nutritional deficiencies, have been proposed for the manifestation of food cravings.²² Conditioned food cues, negative emotion, stress, hormonal changes, and food-related thoughts can cause cravings.²³ Physiological theories (food deprivation), Learning theories (conditioned to food-related cues), Psychological and affect-based theories (emotional states and mood) have been proposed for the manifestation of food cravings.²⁴

Food craving can be differentiated from hunger through its intensity and specificity. A food craving is alleviated only by consuming a specific type of food whereas hunger can be satisfied by taking any type of food. Food craving and hunger often can co-occur. Hunger is not a prerequisite for experiencing a food craving.²² Food cravings are associated with increased consumption of craved foods and they can occur in the absence of hunger.²⁴ Liking and craving are distinct terms that are linked to food addiction. Liking refers to qualitative and affective evaluation of food whereas craving refers to urge or desire to eat a food item.²⁶ Craving can be assessed by asking individuals to self-report their current desire to eat and the current intensity of their craving. Food Craving Inventory is used to assess frequency of cravings for four specific categories of foods (carbohydrates, sweets, fats and fast food fats).²³

Various words such as *Abhipraayam* (preferring or liking), *Ruchim* (desire or interest), *Priyam* (liked or favourite), *Ratim* (loved), *Sakta*

Drishitim (directed towards or fond of) and *Yachinam* (requesting or asking) quoted in the context of *Bhutonmada* (Table 1) represent food cravings that are variable in intensity, frequency, quality, affect or mood, inter-individual, and socio-cultural factors. Two definitions have been most commonly used to describe food craving, behavioural and subjective. Whether biological, cognitive, learning, or some combination of these factors is responsible for the manifestation of food cravings is not clear.²⁷ *Sakta Drishitim* and *Yachinam* denote behavioural responses of food craving; *Abhipraayam* denote cognitive nature and *Ruchim*, *Priyam* & *Ratim* represent emotional properties of food cravings. Various scales and questionnaires such as Food-Craving Inventory (FCI),²⁷ Food Choice Questionnaire (FCQ),²⁸ Three Factor Eating Questionnaire (TFEQ),²⁹ Food Preference Questionnaire (FPQ),³⁰ Universal Eating Monitors³¹ etc are available to measure food cravings qualitatively and quantitatively. Eating behaviour such as food cravings and preferences is influenced by many diverse variables and it is a complex phenomenon.³²

Deva Grahonmada (DG) is one among 18 types of *Bhutonmada* that has shown similarity to Interictal behaviour syndrome of Temporal lobe epilepsy (TLE) or Mania with Obsessive compulsive disorder (OCD). *Dadhi* (yoghurt) and *Ksheera* (milk) *Abhipraayam* (having a positive opinion/preferring/liking) is one of the clinical features of DG.⁵ Dietary habits crucially hinges on consumers' culture, context, socioeconomic status, food environment, perceptions, attitudes, and beliefs. Food is an essential part of Indian culture and deeply rooted to the country's traditions, history, lifestyles, and customs. Food preferences can also serve as a means of communicating personal identity (imitating *Deva* or a divine personality as in DG) and emotional reasoning (*Dadhi* & *Ksheera Abhipraayam* in DG or veganism). Opting for specific dishes can deliver a powerful message and food choices tell the story of family struggles, resistance, migrations, assimilation, adaptation, and group identity. Food preferences are a complex set of human behaviours and they are influenced by biological, genetic, socioeconomic and cultural factors.³³

Dairy foods such as milk (*Ksheera*), yoghurt (*Dadhi*), cheese and cream are one among the most commonly craved and nutrient dense foods.³⁴ Consumption of dairy products (*Dadhi* & *Ksheera*) can increase satiety and also the risk of inducing positive energy balance.³⁵ Bipolar disorder (BD) (DG?) is associated with a high risk for obesity (due to excessive *Dadhi* & *Ksheera* consumption?).

Individuals with BD reported higher frequencies of total food cravings as well as craving for fat (*Dadhi & Ksheera Abhipraayam?*). Episodes of food cravings are associated with feelings of irritability, anxiety, tension and emotional vulnerability.³⁶ A distinct period of abnormally and persistently increased activity or energy is a primary criterion for mania.³⁷ Nutrient dense foods like *Dadhi* and *Ksheera* may fulfil the excessive energy demands during manic episode (DG?). *Ksheera* and *Ghrita* (clarified butter) *Priyam* seen in the patients with *Uraga Grahonmada* (similar to Extra-pyramidal movement disorder - EPMD or Tourette's syndrome - TS) could also be explained with the same logic i.e., to fulfil the excessive energy needs (due to excessive abnormal involuntary movements/tics in EPMD or TS) by consuming nutrient dense foods.¹¹

Asura Grahonmada (AG) is a specific type of *Bhutonmada* that has shown similarity with various personality disorders such as Antisocial personality disorder (ASPD), Narcissistic personality disorder (NPD) and Borderline personality disorder (BPD). *Amisha* (meat) *Ruchim* is one of the clinical features of AG (Table 1). Tyrosine (an essential amino acid and a dopamine precursor) is abundantly available in protein-rich foods such as turkey and chicken (*Amisha*). Brain can synthesize dopamine from foods those are rich in tyrosine. Chicken, red meat (*Amisha*), eggs, and dairy products contain the amino acid tryptophan, which the body can convert into niacin. Tryptophan poor diet is linked with aggressive behaviour. Underlying deficiency of various nutrients may provoke the food cravings (*Amisha Priyam*) in the individuals suffering with AG. Nutritional deficiencies might cause offending and antisocial behaviours and there is a link between poor diet and psychiatric problems such as anxiety, depression and impulsivity. Micronutrients such as Omega-3 fatty acids, zinc, folic acid, magnesium, and Vitamin D have been studied in relation to behaviour and mood. *Amisha Priyam* mentioned in AG denote craving towards protein rich foods (meat) due to various underlying nutritional deficiencies.⁶ *Rakta* (blood) & *Amisha Priyam* of *Rakshasa Grahonmada* (that has shown similarity to ASPD and mania) (Table 1) could also be explained with the similar logic i.e., craving for foods those are rich in protein, iron, folic acid etc.¹⁰

Pitru Grahonmada (PG) is a condition that has shown resemblance with Vitamin B₁₂ deficiency induced neuropsychiatric conditions. *Tila* (sesame seeds), *Guda* (jiggery), *Maamsa* (meat) and *Paayasa* (milk porridge) *Priyam* (fond of) is mentioned as one of the clinical features of PG. *Tila*, *Guda*, *Maamsa*, and *Paayasa Priyam* of PG indicate craving toward foods those are rich in calcium, iron, aminoacids, proteins, sugars and vitamin B₁₂. These specific food cravings quoted in PG may denote deficiency of various vitamins or minerals. These food cravings of PG might have induced by Vitamin B₁₂ and/or other deficiencies.⁷ Vitamin B₁₂ and folate deficiencies are linked to cognitive deficits, atrophy of the brain, dementia, severe depression, psychosis, myelopathy, neuropathy, pernicious anaemia and various other neuropsychiatric abnormalities. Vitamin B₁₂ is exclusively present in non-vegetarian foods such as meat, eggs, shellfish, and fish (*Maamsa*). *Maamsa Ratim* of *Pishacha Grahonmada* denote craving for meat/proteins in due to an underlying nutritional deficiency and/or malabsorption.¹²

Clinical features of *Nishada Grahonmada* (NG) have shown similarity to conditions such as, BPSD (Behavioural and psychological symptoms of dementia), FTD (Frontotemporal dementia) and Hebephrenia. Patients with bv-FTD (behavioural variant FTD) commonly crave for sweets or carbohydrates (*Guda*, *Madhu*, *Parmaanna* etc), or express rigid preferences for particular foods and binge eating (*Annapaana Ratim*). Patients of Alzheimer's dementia have an increased preference for sweet foods (*Guda*, *Madhu*,

Parmaanna etc). The use of sweet (*Guda*, *Madhu*, *Parmaanna* etc), protein-dense foods (*Amisha/Maamsa*) especially at dinner is most evident in those patients displaying psychomotor dysregulation.¹³ *Ama Maamsa Palala Mulaka Apupa Paramaanna Yachinam* (begging for raw meat, paste of sesame seeds and sweet dishes) is mentioned in *Virupaksha Grahonmada* (VG). Cravings toward non-vegetarian food items (*Maamsa*) denote underlying deficiency of folic acid, amino acids, proteins, iron, vitamins, minerals, and various other micronutrients. *Ama Maamsa Palala Yachinam* in VG denotes carbohydrate and protein food cravings.¹⁶ Food cravings explained in other *Bhutonmadas* (Table 1) could also be explained as the manifestations induced by either biological or emotional or cognitive factors or combination of all these factors.

Humans typically crave energy-dense foods (*Dadhi & Ksheera Abhiprayaam* in DG and *Ksheera & Ghrita Priyam* in *Uraga Grahonmada*) such as chocolate and other high-caloric sweet (*Guda & Paayasa Priyam* in PG, *Guda & Madhu Priyam* in *Uraga Grahonmada* and *Paramaanna Yachinam*-begging for milk porridge in *Virupaksha Grahonmada*) and savory foods. Cultural differences are commonly found in food cravings i.e., craving for *Paramaanna* an Indian dish mentioned in the context of *Virupaksha Grahonmada*.²² Craving can be experienced for specific foods (e.g., *Guda*, *Madhu*, *Ksheera* etc), for groups of foods (e.g., *Paramaanna*), and for food in general (e.g., *Annapaana Ratim*).²³ HPA axis activation could increase cravings towards sweets (*Guda*, *Madhu*, *Paramaanna* etc) in individuals with binge eating disorder. Cravings are typically for foods that are high in fat (*Ghrita*), sugar (*Guda & Madhu*), and carbohydrates (*Apupa & Paramaanna*).²⁴ Foods those are high in sugar (*Guda & Madhu*) and/or fat content (*Ghrita*) are highly palatable and energy dense.²⁵

Carbohydrate-rich foods like chocolate, sweets (*Guda*) and sweet desserts (*Apupa & Paramaanna*) are the most craved foods. There is a strong link between food cravings and mood.³⁶ Carbohydrate rich meal affects the brain neurotransmitters levels by facilitating the entry of tryptophan in to the brain. Tryptophan and serotonin promote the feeling of well being that is triggered by carbohydrate rich foods.³⁸ Protein cravers (*Maamsa/Amisha Priyam*) have reported feeling hungry, happy or bored at the onset of craving.³⁶ Foods rich in high quality protein include meats (*Maamsa/Amisha*), milk (*Ksheera*) and other dairy products (*Dadhi & Ghrita*), and eggs. Protein intake can affect the brain functioning and mental health.³⁸ Higher protein diets (*Maamsa/Amisha*) were shown to reduce hunger, increase satiety, reduce food cravings and feelings of deprivation.³⁹ High energy density (*Ksheera*) and fat content (*Ghrita*), and low protein and fiber contents are identifying characteristics of craved foods.⁴⁰ Individuals with food addiction had higher dietary fat intake (*Ghrita*) especially saturated fat and higher craving ratings for fatty foods. Individuals with a strong liking for fat had high consumption of saturated fats (*Ghrita*), meat (*Maamsa/Amisha*), butter, sweetened cream desserts (*Paramaanna?*) etc.²⁶

Depressive symptoms and chronic stress are associated with a preference for fast food, sweet food (*Madhu*, *Guda*, *Apupa*, *Paramaanna* etc), and food addiction (*Annapaana Ratim*). Negative emotional states (e.g., *Rakshasa & Asura Grahonmada*) are associated with increased intake of convenience food. Depression in female patients with psychosis is associated with food cravings (*Ratim/Ruchim/Priyam/Yachinam*). Low self-esteem and negative affect (*Virupaksha*, *Rakshasa & Asura Grahonmada*) are the common findings in patients with binge eating (*Annapaana Ratim*).⁴¹ Craving for carbohydrates (*Guda*, *Paramaanna*, *Apupa* etc) is found to be linked with eating disorders, obesity, seasonal affective disorder and the premenstrual syndrome. Anxiety, fatigue, and depression have

preceded craving episodes in majority of carbohydrate cravers. Food cravings (*Ratim/Ruchim/Priyam/Yachinam*) are linked with solitude, annoyance, boredom, feelings of anxiety, irritability, depression, tension and emotional vulnerability (commonly seen across various *Grahonmadas*). Individuals with Bipolar disorder, exhibit more stress, negative mood and food cravings.³⁶

Abnormal eating behaviours & Bhutonmada

Various disordered eating behaviours or eating abnormalities can be seen in *Bhutonmadas* (Table 2). *Bhojana Anabhilaashinam/Anannabhilasha* (not interested in food), *Arochaka* (anorexia), *Aahaara Dveshinam/Anna Dveshinam* (disliking food), *Alpaahaara* (reduced food intake), *Na Kshuda* (complete loss of appetite), *Annapaana Ratim* (binge eating), *Bahvaashinam/Bahu Bhuk/Bahusha Yachantam* (excessive food intake), *Bhramad Bhojinam* (eating while walking), *Kshudhadhikam/Kshudaatura* (excessive hunger), *Lolam* (gluttonous), *Na Trishaarta* (not thirsty), *Yachantam Udakam/Bahusha Toyam Yachantam* (asking for water or thirsty) and *Trishna Bahula* (excessive thirsty) are the different terms mentioned in *Bhutonmadas* (Table 2) and they represent various eating disorders/abnormal eating behaviours/disordered eating attitudes. Food cravings discussed in the previous section are usually comorbid with various abnormal eating behaviours, such as overeating (*Bahvaashinam/Bahu Bhuk/Bahusha Yachantam*), emotional eating (*Lolam*), binge eating (*Annapaana Ratim*), strange eating habits (*Bhramad Bhojinam*) and excessive body weight. Food cravings may lead to emotional eating through inflexible coping styles and a lack of mindful eating behaviours. Reactivity to food cues and impulsivity may lead to abnormal eating behaviours.⁴²

Eating disorders are characterized by excessive (*Bahvaashinam/Bahu Bhuk/Bahusha Yachantam/Annapaana Ratim/Lolam Kshudhadhikam/Kshudaatura*) or insufficient food intake (*Bhojana Anabhilaashinam/Anannabhilasha/Arochaka/Aahaara Dveshinam/Anna Dveshinam/Alpaahaara/Na Kshuda*). Anorexia nervosa, Bulimia nervosa, and binge eating are the most common forms of eating disorder. Atypical eating disorder is characterized by weight loss, rumination, and an extremely picky eating habit. Various psychiatric co-morbidities such as anxiety disorder, depression, OCD, substance abuse, Attention-deficit hyperactivity disorder (ADHD), and personality disorders are common in patients with eating disorders. Eating disorders have multiple etiologies including biological (*Na Kshuda/Kshudhadhikam/Yachantam Annam*), developmental, and socio-cultural and psychological (*Lolam/Aahaara Dveshinam/Anna Dveshinam/Bhramad Bhojinam*).⁴³ Anxiety and depression clusters are associated with concerns, behaviours, and severity indicative of eating disorders.⁴⁴

Five types of disordered eating behaviours could be assessed using the Structured Clinical Interview for DSM-V (SCID): objective binge eating (OBE-eating large amount of food over a short time, associated with lack of control over eating), subjective binge eating (SBE-eating an amount of food that is not objectively large, but subjective feelings of too much, associated with lack of control over eating), loss of control over other eating episodes (LOC-feeling that one could not control what/how much they eat outside of OBE/SBE), purging behaviours (vomiting or use of laxatives to control weight), and non-purging compensatory behaviours (excessive exercise, fasting, or strict dieting).⁴⁵ Abnormal eating behaviours mentioned in *Bhutonmadas* (Table 2) come under either OBE or LOC categories. Disordered eating behaviours are positively associated with anxiety, depression, suicidal thoughts and self-harm. Personality traits related to impulsivity and affectivity (i.e., seen in DG & AG) are more

consistently associated with severe eating pathology.⁴⁶ Disordered eating, binge eating, night eating, food cravings, food addiction and other disordered eating behaviours have been reported among people with schizophrenia spectrum disorders.⁴⁷

Anabhilaashinam and *Anannabhilasha* (as in *Deva & Pitru Grahonmadas*) words denote loss of appetite or reduced appetite whereas *Anna* or *Aahaara Dveshinam* (as in *Rakshasa & Preta Grahonmada*) represents restrained eating or negative mood states. *Na Kshuda* (as in *Grahaka Grahonmada*) denotes complete loss of appetite or anorexia. *Kshudhadhikam & Bahvaashinam* (as in *Pishacha Grahonmada*) denotes voracious appetite leading to excessive consumption of food. Terminology pertaining to various abnormal eating behaviours mentioned in *Bhutonmadas* (Table 2) represents appetite abnormalities leading/not leading to excessive or low food consumption. *Bhojana Anabhilaashinam* mentioned in DG may denote anorexia nervosa seen in TLE patients.⁴⁸ *Anannaabhilasha, Arochaka, Avipaaka* (indigestion), *Alpaagni* (low metabolism), and *Manda paavaka* (impaired or slow digestion) of *Pitru Grahonmada* denotes Vitamin B₁₂ deficiency induced gastrointestinal tract abnormalities such as malabsorption, atrophic gastritis, *H. pylori* infection etc.⁷ *Annapaana Ratim* of *Yaksha Grahonmada* denotes ravenous appetite or food cravings or addictions that are seen in the patients of Bipolar disorder.⁹ *Shankitam* (suspiciousness/paranoid delusions), *Deenata* (depression) and *Madya Priyata* (alcohol dependence/alcohol abuse) mentioned in *Rakshasa Grahonmada* either independently or together may cause loss of appetite or food refusals (*Anna Dveshinam*).¹⁰

Bahvaashinam (overeating/hyperorality/hyperphagia/food fads), *Kshudhadhikam* (increased appetite) and *Lolam* (strange eating habits/gluttony/food cramming/indiscriminate eating) mentioned in *Pishacha Grahonmada* may denote alterations in eating behaviours that are commonly seen in the patients with FTD.¹² *Aahaara Dveshinam* mentioned in *Preta Grahonmada* may denote refusal to food intake due to social negativism seen in the patients with catatonia.¹⁴ *Yachantam Annam* mentioned in *Maukirana Grahonmada* denotes increased appetite that may be due to excessive catabolism or hyperactivity or impaired carbohydrate metabolism commonly seen in the patients with thyrotoxicosis or hyperthyroidism. *Yachantam Udakam* (excessive thirst) of *Maukirana Grahonmada* denotes dehydration or electrolyte imbalance caused by polyuria, glycosuria, frequent bowel movements, and excessive metabolism and sweating in patients with hyperthyroidism or thyrotoxicosis.¹⁵ Disturbances of fluid and electrolyte balance could be seen in acute exacerbations of bipolar disorder, and it has been attributed to redistribution of water and electrolytes, altered fluid and electrolyte metabolism and changes in fluid and solute intake. Mania is associated with retention of water and is accompanied by pathological thirst (*Bahusha Toyam Yachantam*). *Yachantam Udakam* of *Yagnasena Grahonmada* denotes polydipsia or dehydration or electrolyte imbalances that can be seen in the patients with TS-plus (Tourette syndrome - plus) or mania.¹⁶

Bhramad Bhojinam (eating food while moving around/wandering/restlessness) and *Bahvaashinam* mentioned in *Nistejasa Grahonmada* may denote hyperorality, hyperphagia and strange eating habits seen in patients with FTD.¹⁶ *Kshudaatura* (excessive hunger) mentioned in *Kubera* or *Yaksharaat Grahonmada* denotes voracious appetite or hyperphagia seen in the patients with hypomania/bipolar depression.¹⁷ *Na Kshuda* (loss of appetite) and *Na Trishaarta* (not feeling thirsty/adipsia/hypodipsia) mentioned in *Grahaka Grahonmada* may denote anorexia/asociality/social negativism/avolition/depressed mood seen in the patients with catatonia or major depressive episode or negative symptoms of schizophrenia.¹⁷ *Bahu Bhuk* (overeating) and *Trishna Bahula* (excessive thirst) mentioned in *Pittaja Unmada* (a

condition that has shown similarity with hyperthyroidism with or without mania) denotes hyperphagia and polydipsia respectively.¹⁹ *Anannabhilasha*, *Arochaka*, and *Alpaahaara* mentioned in *Kaphaja Unmada* (a condition similar to myxedema psychosis/hypothyroidism) denotes anorexia or anhedonia or hypophagia seen in the patients with hypothyroidism with or without depression.²⁰

Alcohol abuse & Bhutonmada

The criteria for diagnosing substance (alcohol) abuse, describe a substance that is often taken in larger amounts or over a longer period of time than intended, persistent desire or unsuccessful efforts to control or to cut down substance use (alcohol), and continued use despite awareness of having persistent physical and/or psychological problems along with tolerance and dependency.²⁶ Many alcoholics experience craving for alcohol and craving has been recognized as a central component of the alcohol dependence syndrome.⁴⁹ Craving is a core component of addiction and it appears to play an important role in compulsive use of addictive substances such as alcohol.⁵⁰ There are wide cultural variations in attitudes toward alcohol consumption, patterns of its use, accessibility and physiological reactions to alcohol. Use/abuse of alcoholic beverages has been mentioned in the symptomatology of various *Grahonmadas* (Table 3) along with food cravings and abnormal eating behaviours. *Sura* is prepared by fermenting a mixture of water, rice flour and jaggery and it is similar to beer.⁵¹ *Sura Abhiprayam* mentioned in *Deva Grahonmada* denotes non-pathological alcohol consumption (i.e., social drinking) rather than alcohol abuse.⁵ *Sura Priyam* (like to drink alcohol) mentioned in *Asura Grahonmada* denotes alcohol abuse seen in the patients with BPD, NPD and ASPD.⁶

Alcohol abuse is a major comorbidity in bipolar patients. *Paana Ratim* (craving for alcohol) mentioned in *Gandharva Grahonmada & Madya Priyam* (fond of alcohol) mentioned in *Yaksha Grahonmada* denotes alcohol abuse in patients with Bipolar disorder.^{8,9} Conduct disorder and ASPD are the known risk factors for substance use disorders in patients with schizophrenia and other severe psychiatric illnesses. Among individuals with alcohol use disorder, ASPD is associated with a more severe course of addiction. There is a strong association between aggressive behaviour and alcohol consumption. *Madya Priyam* mentioned in *Rakshasa Grahonmada* denotes alcohol abuse and its associated complications in patients with ASPD, BPD, and schizophrenia.¹⁰ FTD patients are known to develop obsessions with particular foods and alcohol. *Madya Ratim* mentioned in *Pishacha Grahonmada* may denote alcohol cravings/dependence/tolerance seen in the patients with FTD.¹² *Madya Sakta Drishtim* (searching/craving for alcohol) mentioned in the context of *Nishada Grahonmada* denotes alcohol dependence due to behavioural disinhibition in the patients with dementia or hebephrenia.¹³ Various terms (i.e., *Abhiprayam*, *Ruchim*, *Priyam*, *Ratim* and *Sakta Drishtim*) pertaining to alcohol use/abuse have been used in the context of *Bhutonmada* (Table 3) and they do possess different contextual meanings.

Conclusion

Bhutonmada is an umbrella term explained in classical *Ayurvedic* texts that incorporates various psychiatric and neuropsychiatric conditions. Symptomatology pertaining to food cravings, abnormal eating behaviour and alcohol abuse has been mentioned in the context of *Bhutonmada*. *Abhiprayam*, *Ruchim*, *Priyam*, *Ratim*, *Sakta Drishtim* and *Yachinam* are the various terms quoted in the context of *Bhutonmada* represent variability of food cravings that depends on various factors such as intensity, frequency, quality, mood, inter-individual, and socio-cultural. *Sakta Drishtim* and *Yachinam* denote behavioural responses, *Abhiprayam* denote cognitive nature and

Ruchim, *Priyam* & *Ratim* represent emotional properties of food cravings. *Yachinam*, *Ratim* and *Sakta Drishtim* denote severe intensity whereas *Abhiprayam* denote mild intensity and *Ruchim* & *Priyam* fall between i.e., moderate intensity of food cravings. Food cravings are usually comorbid with various abnormal eating behaviours, such as overeating/hyperphagia (*Bahvaashinam/Bahu Bhuk/Bahusha Yachantam*), emotional eating (*Lolam*), binge eating (*Annapaana Ratim*), strange eating habits (*Bhramad Bhojinam*), hypophagia (*Alpaahaara*) etc. Terminology pertaining to various abnormal eating behaviours mentioned in *Bhutonmadas* also includes appetite abnormalities (i.e., *Anannabhilasha/Arochaka/Na Kshuda/Kshudaatura*) those manifest into either excessive (*Bahvaashinam/Bahu Bhuk*) or low food consumption (*Alpaahaara/Anna Dveshinam*). Various terms (i.e., *Abhiprayam*, *Ruchim*, *Priyam*, *Ratim* and *Sakta Drishtim*) pertaining to alcohol use/abuse have been used in the context of *Bhutonmada* possess different contextual meanings.

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Conflict of interest

None.

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