

# Madyaamisha Sakta Drishti of Bhutonmada: attentional bias to alcohol and food-related visual cues

## Abstract

*Bhutonmada* or *Grahonmada* (psychiatric and/or neuropsychiatric conditions described in Ayurveda having an idiopathic manifestation) is a specific type of *Unmada* (broad diagnostic entity that encompasses a wide range of psychiatric conditions) explained in *Ayurvedic* (a holistic system of medicine) texts characterized by various abnormal or superhuman behaviour, perception, speech and memory. Craving towards specific foods and alcohol are the common clinical findings across *Bhutonmadas*. Several *Ayurvedic* terms are used in the context of *Bhutonmada* to describe various dimensions and intensities of cravings, from a mild preference to an intense, addictive desire. The idea of quantifying cravings (in the context of *Bhutonmada*) using *Ayurvedic* terminology has been proposed in the present work. The present work also explores how contemporary psychological concepts of attentional biases, cognitive errors, information processing errors, maladaptive and impulsive behaviours can be interpreted in Ayurveda primarily through the concepts of *Dhee*, *Dhriti*, *Smriti* *Vibhrama* (attentional memory biases) and *Pragnaparahda* (cognitive errors/biases). *Madyaamisha Sakta Drishti* (a clinical feature of *Bhutonmada* characterized by sustained gaze on alcohol and meat-related visual cues), and its similarities to the modern concept of attentional bias to alcohol and specific food-related visual cues, measured using eye-tracking technology in contemporary practice, has been explored in the present work.

**Keywords:** *Ayurveda*, craving, *grahonmada*, *pragnaparahda*, psychiatry, *unmada*

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## Introduction

*Unmada* (psychosis) is a broad *Ayurvedic* diagnostic entity that incorporates various psychiatric and neuropsychiatric illnesses.<sup>1</sup> It is characterized by the derangement of various mental functions, including perception, cognition, memory, psychomotor activity, personality, and behaviour.<sup>2</sup> According to *Ayurvedic* texts, *Unmada* is classified in different ways by various authors, though certain core types remain consistent across most texts.<sup>3</sup> *Bhutonmada*, or *Grahonmada*, or *Agantuja Unmada* is a specific type of *Unmada*, characterized by a range of abnormal and/or superhuman behaviours, including heightened energy, reckless actions, speech abnormalities, and enhanced or impaired cognitive functions.<sup>4</sup> It is believed to be caused by the possession of 'Graha' or 'Bhuta' (demon/evil spirit/ an idiopathic entity) rather than *Doshic* imbalance (vitiation of body humors). Contemporary *Ayurvedic* researchers and scholars explore the concept of *Bhutonmada* as a framework for understanding various complex and multi-faceted psychiatric and/or neuropsychiatric conditions, rather than literal demonic possessions.<sup>5</sup>

The classification and clinical presentation of *Bhutonmada* vary significantly across different *Ayurvedic* texts. *Sushruta Samhita* lists eight types (*Deva*, *Asura*, *Gandharva*, *Yaksha*, *Pitru*, *Naga*, *Rakshasa*, and *Pishacha*), while the *Charaka Samhita* describes eleven types and the *Ashtanga Sangraha* & *Hridaya* enumerates eighteen types of *Bhutonmada*. These classifications are based on the presumed *Bhuta*/*Graha* causing the condition, and are considered innumerable in total.<sup>1</sup> An analysis of *Bhutonmada*, suggests that it's associated alcohol misuse and abnormal eating behaviours have complex origins and significant clinical implications. While the specific role of these behaviours in *Bhutonmada* is still being researched, modern perspectives from addiction science and nutritional psychiatry provide potential insights. Specific food cravings, and alcohol abuse are not

just peripheral symptoms of *Bhutonmada* but are intertwined with the psychological distress of the condition.<sup>1</sup>

*Ayurvedic* texts describe cravings with several terms that indicate different intensities, from a mild preference to an intense, addictive desire. The quantification and pathophysiology of cravings, especially in the context of *Bhutonmada*, requires further in-depth exploration. Various attentional biases, cognitive distortions, and errors in information processing that drive cravings for food and alcohol in *Bhutonmada* context require further clarity, and the present work is aimed at it. The present work also explores the utility of the clinical feature, 'Madyaamisha Sakta Drishti' (a sustained, compulsive focus on alcohol and meat/specific food items) of *Bhutonmada* as an objective clinical and diagnostic parameter for assessing attentional bias to food- and alcohol-related visual cues.

## Methodology

Classical *Ayurvedic* texts along with commentaries, published articles on *Bhutonmada*/*Grahonmada*, and contemporary literature pertaining to attentional biases, cognitive errors, cravings, alcohol addiction or abuse, specific food cravings, etc., have been searched by using appropriate keywords from the databases including Google Scholar, PubMed, and Scopus. Open-access and full-length research articles published in the English language were included. Conclusions have been drawn after analysing and interpreting the obtained literature.

## Discussion

### Ayurvedic terminology for cravings in Bhutonmada context

In Ayurveda, the concept of cravings (food and alcohol related) is represented by several terms including Madyaamisha Sakta

Drishti, Abhipraayam (opinion/preoccupied towards food and alcohol), Ratim (pleasure seeking/strong desire), Ruchim (hedonic hunger/delicious food cravings), Priyam (liked/intense desire to specific food items), Yaachinam (begging/food or alcohol seeking behaviour), Abhilaashinam (affection/longing for/desiring), Bahvaashinam (hyperphagia), Lolam (greedy/lustful/gluttony), Kshudaatura (homeostatic hunger/pathological hunger), Bahu Bhuk (excessive food intake/hyperphagia), Bhramaad Bhojinam (gluttony/hedonic hunger/dysregulated food consumption) and Kshudadhikam

(excessive hunger) in Bhutonmada context (Table 1). Craving towards specific foods and alcohol are the common clinical findings across Bhutonmadas. Cravings toward meat (Amisha/Maamsa) may denote an underlying deficiency of various micronutrients such as proteins, amino acids, minerals, vitamins, folic acid etc. Alcohol addiction or dependence is a common finding seen in the symptomatology of various Grahonmadas.<sup>1</sup> It is evident that cravings and dysregulated consumption of alcohol and specific foods is a common comorbid finding across Bhutonmadas.<sup>1</sup>

**Table 1** Ayurvedic terminology pertaining to addictions and cravings in Bhutonmada context

Ayurvedic terms	Relevant contemporary interpretation
<i>Dhee</i>	Selective attention
<i>Dhriti</i>	Sustained attention Impulse inhibition or control
<i>Smriti</i>	Working memory or memory
<i>Pragna/Pragya/Buddhi</i>	Cognition/decision taking capacity Secondary information processing
<i>Kalpyate manasaat</i>	Primary information processing
<i>Dhee vibhrama or vibhramsha</i>	Preferential attentional processing Selective attentional bias Engagement bias Automatic detection Initial orientation
<i>Dhriti vibhrama or vibhramsha</i>	Maintaining attentional focus Ruminating Heightened attention Difficulty in disengaging from cues or disengagement bias Poor impulse control High impulsivity Gaze maintenance
<i>Smriti vibhrama or vibhramsha</i>	Maladaptive memories Impaired memory Metacognition Cue exposure and conditioning Non-planning impulsivity
<i>Pragnaparadha/Pragyaparadha</i>	Cognitive errors or biases Addictive behaviours Impaired executive function Overvaluing immediate rewards Emotional reasoning Catastrophizing Motor and trait impulsivity
<i>Abhipraayam</i>	Cognitive component of cravings Preoccupied states Ruminating Emotional component of cravings Positive reinforcement
<i>Ruchim, ratim, priyam &amp; abhilaasha</i>	Anticipation of pleasure (highly palatable food items) Expectation of positive affect or reward (highly palatable food items) Strong urge or desire/inability to avoid Compelling desire
<i>Sakta drishtim</i>	Selective attentional bias to food and alcohol related visual cues
<i>Yaachinam, bahvaashinam, lolam, kshudaatura, bahu bhuk, bhramaad bhojinam and kshudadhikam</i>	Physiological or behavioural component of cravings Food seeking and dysregulated eating behaviour Gluttony Hyperphagia Specific food cravings

The word Abhipraayam denotes intention or desire or preoccupied or anticipatory domain of a craving or addiction. Dadhi (curd), Ksheera (milk) and Sura (alcoholic beverage) Abhipraayam is one of the clinical features of Deva Grahonmada. It may represent the

social positive reinforcement behaviour or a cognitive component of cravings. Several terms such as Abhilaashinam/Abhilaasha, Ruchim, Ratim and Priyam represent emotional dimension of craving with moderate intensity. These terms denote active craving phase with an

intense desire or urge towards alcohol or specific food items. These terms may represent anticipation of the pleasure or expectation of reward and positive reinforcement.<sup>1</sup> The word 'Madya' or 'Sura' denotes an alcoholic beverage, 'Amisha' or 'Maamsa' denotes meat and 'Sakta Drishti' represents fixed gaze on a specific object/a fondness for alcohol and meat. Madyaamisha Sakta Drishti is one of the clinical features of Nishada Grahonmada and it represents fixed gaze on a craved object such as alcohol and specific food items (meat).<sup>6</sup> Madyaamisha Sakta Drishti may denote attentional bias to alcohol and food related visual cues and a seeking phase. The terms Yaachinam and Kshudaatura may represent underlying physiological states or homeostatic hunger or food seeking behaviours whereas terms such as Kshudadhikam, Bahu Bhuk, Bhramaad Bhojinam, Bahvaashinam and Lolam represents dysregulated food consumption behaviours, gluttony, hyperphagia, and hedonic hunger. These terms denote severe addictive behaviours, executive dimension of cravings and consumption phase of drugs/specific food items. These Ayurvedic terms could also be used to quantify the intensity of cravings/addictive behaviours in the context of Bhutonmada (Figure 1).



**Figure 1** Ayurvedic terminology for craving quantification

### Attentional biases, cognitive errors and cravings in Bhutonmada context

Craving is defined as a subjective experience of intense desire and an urgency to use a substance (seeking alcohol or a specific food item) or perform a behaviour (consuming alcohol or specific foods). Craving is a multi-dimensional and complex phenomenon, involving emotional (Ruchim, Ratim, Priyam, Abhilaashinam etc.), cognitive (Abhipraayam), physiological (Kshudaatura) and sensory (Sakta Drishti) components.<sup>7</sup> Feeding involves cognition (learning, decision making, memory), emotion (craving, motivation), sensory (taste, visual, olfactory) and motor behaviours. Food-related behaviours could be examined by three phases, food craving, seeking, and consumption. Food craving phase is characterized with high desire and preoccupation toward food (Priyam, Abhipraayam, Ratim, Ruchim etc.). Food seeking phase is characterized by searching and approaching for food (Sakta Drishti & Yaachinam). Food consumption phase denotes actual consumption of the food (Bahu Bhuk, Bahvaashinam, Bhramaad Bhojinam etc.).<sup>8</sup> Meat supplies various nutrients, high-quality proteins, vitamin B12, retinol, omega-3 fatty acids, iron, zinc and other bioactive compounds.<sup>9</sup> Specific food cravings to high-calorie/energy dense food items (dairy products, meat etc.) found across Bhutonmadas may also represent underlying deficiency states or homeostatic hunger.<sup>1</sup> Problematic food and alcohol consumption are often comorbid<sup>10</sup> and this comorbidity is seen across the clinical presentation of various Bhutonmadas.<sup>1</sup>

Alcohol users show an attentional bias towards alcohol-related cues (Madya Sakta Drishti) in the environment. Based on cognitive

models of substance use, Madya Sakta Drishti may denote a cognitive phenomenon where a person's attention is automatically drawn towards alcohol-related cues (Madya Sakta Drishti). This bias is considered a causal factor in dysregulated and excessive drinking (Paana Ratim). Spending more time fixated on alcohol-related images (Madya Sakta Drishti) is a sign of attentional bias toward alcohol cues, and individuals with higher-risk substance use patterns typically exhibit this bias more strongly than others. This heightened attention can impair processing of other information and is a common feature in addictive behaviours.<sup>11</sup> An attentional bias is the tendency to selectively focus on substance-related cues in the environment. Selective visual attention drives the persistence of addiction through a self-reinforcing "bias-craving-bias" cycle. The visual probe task is a common method for measuring alcohol-related attentional bias. Attentional engagement and/or disengagement both attentional biases are strongly linked to alcohol consumption frequency and quantity.<sup>12</sup> Cue-elicited craving is a key component of theories like the incentive-sensitization theory, which suggests that repeated drug use sensitizes the brain to drugs and cues, increasing a person's desire for them. Cues also lead to attentional biases towards alcohol, creating a cycle where increased attention to cues heightens craving, which in turn strengthens attentional bias leading to and maintaining drug-seeking behaviour.<sup>13</sup>

Decision-making is determined by the interaction between the two systems, reflective system (associated with conscious, deliberate and controlled responses and responsible for higher-level cognitive functions such as executive control and working memory), and the impulsive system (associated with automatic, habitual, reward-seeking and appetitive behaviours and operates on a more unconscious level and driven by immediate urges and desires). Substance abuse would emerge from an imbalance, caused by the under-activation of the reflective system, and the over-activation of the impulsive system.<sup>14</sup> Attentional biases related to alcohol, further encourages drinking-related behaviours (approach behaviours) as a result of explicit (conscious craving) or implicit (unconscious wanting) processes.<sup>15</sup> Impaired attentional processing (the inability to effectively control and direct one's attention), craving induced sensitization (with repeated use, the brain's response to the cue or trigger for a reward becomes more and more intense, independent of the actual pleasure received from the reward), increased saliency of cues (stimuli associated with the desired substance or behaviour become more attention-grabbing and stand out more in the environment), information processing bias (the general tendency for people to pay more attention to things that are relevant to their current concerns or goals), automatic detection (The initial capture of attention by concern-related stimuli happens involuntarily and without conscious effort), desire related thoughts and behaviours (the detection of a cue triggers a cascade of thoughts about the desired item and leads to subsequent actions to obtain it), initial orientation (the first stage of attention bias, where a person rapidly directs their attention toward a salient cue), and gaze maintenance/delayed disengagement (the second stage, where a person finds it difficult to shift their attention away from a salient cue) are the various types of attentional biases and/or information processing errors in cravings/addictive behaviours.<sup>16</sup>

Higher intake of palatable foods may be caused by high impulsivity (high preference for immediate reward or poor motor response inhibition) and high susceptibility to food-related impulses (approach bias toward food). Attentional impulsivity (inability to focus), motor impulsivity (acting without thinking), and non-planning impulsivity (lack of future forethought) are the three facets of impulsivity. Trait impulsivity is a predisposition to act quickly and without planning,

disregarding negative outcomes.<sup>17</sup> Attentional biases can be measured by indirect inference (reaction time), or directly (e.g., by monitoring eye movements), or by other measures including eye-tracking (ET) technology. The ET technology is useful to detect the oculomotor activity such as eye gaze, position, or movement. Key eye-movement parameters include pupillary dilation, saccades, first fixation (earliest attention), and dwell time or number of fixations (sustained attention). These parameters can be used to analyse how attention is deployed, from initial processing to deliberate cognitive processing.<sup>18</sup>

The process of Gnanotpatti (perception), is a complex interaction involving the external world (Indriyaartha), the sensory organs (Indriya), the mind (Manas), the intellect (Buddhi), and the soul (Atma). It moves from initial sensory contact to final conscious knowledge, incorporating the specific cognitive functions of Dhee (discriminative ability or selective attention), Dhriti (sustained or focused attention), and Smriti (working memory). Buddhi (cognition/decision taking capacity/intellect) is the faculty of higher reasoning and understanding. The components of Pragma/Pragna/Buddhi are Dhee, Dhriti, and Smriti. The information is passed to the intellect (Buddhi/Pragna), which uses its three components to process the data, Dhee, Dhriti and Smriti. Proper functioning of the three mental faculties, Dhee, Dhriti, and Smriti is considered essential for healthy perception and cognition. Any derangement, or Vibhrama, of these faculties leads to Pragyaaparadha/Prajnaparadha, denotes cognitive errors or biases.<sup>19</sup> The various types of Bhutonmada described in Ayurvedic texts often mention specific cravings or addictive behaviours, such as craving meat, sweets, or alcohol. These descriptions reflect how the impairment of (Vibhrama/Vibhramsha) cognitive faculties (Dhee), willpower (Dhriti), and memory (Smriti) manifest in concrete, dysfunctional behaviours and cognitive errors (Pragyaaparadha) (Table 1).

## Conclusion with clinical implications

Alcohol and specific food-related cravings and addictive behaviours are commonly seen across the symptomatology of various *Bhutonmadas* (psychiatric and/or neuropsychiatric disorders having an idiopathic origin/manifestation). Several *Ayurvedic* terms are used in the context of *Bhutonmada* to describe various dimensions and intensities of cravings. The *Ayurvedic* concepts of *Dhee*, *Dhriti*, *Smriti* *Vibhrama* (impairment of selective, sustained attention and memory) and *Pragnaparadha* (cognitive biases/errors) provide a robust framework for understanding modern psychological issues such as attentional biases, cognitive errors, information processing errors, and maladaptive/addictive behaviours related to alcohol and specific food cravings. *Ayurvedic* terminology can be used to describe the intensity of cravings by using various terms, primarily sourced from descriptions of *Bhutonmada*. These terms range in intensity from mild preference to a strong, demanding urge. *Ayurvedic* terminology could be used to inform the development of a scale or a questionnaire to quantify craving intensity. *Madyaamisha Sakta Drishti*, a clinical feature mentioned in the context of *Bhutonmada*, which refers to attentional bias to alcohol and specific food-related visual cues or a specific type of abnormal or stuck gaze/vision, has conceptual similarities to the contemporary eye-tracking technology in modern medical practice. *Sakta Drishti* seems to be an objective, quantifiable, and cost-effective way to measure gaze patterns as a diagnostic parameter to identify attentional biases, alcohol and specific food-related cravings in the context of *Bhutonmada*.

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## Conflicts of interest

The authors declare that there are no conflicts of interest.

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