Digital Reward Dependency and Raja–Tama Dominance: An Integrative Review of Neurobehavioral Addiction Through Ayurvedic Psychology

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Abstract- Digital technologies have revolutionized communication, education, entertainment, and social interaction. Smartphones, social media platforms, short-form video applications, online gaming, and streaming services have become indispensable components of contemporary life. While these technologies provide substantial benefits, excessive engagement has contributed to the emergence of digital behavioral dependency. Contemporary neuroscience attributes this phenomenon to repeated activation of dopamine-mediated reward pathways, resulting in reinforcement of compulsive digital behaviors. Prolonged exposure to digital stimuli has been associated with reduced attention span, sleep disturbances, emotional dysregulation, anxiety, and impaired productivity.

Ayurveda provides a comprehensive framework for understanding human behavior through the concepts of *Manas*, *Triguna*, *Prajnaparadha*, and *Manasika Doshas*. *Raja* and *Tama* are regarded as the two *Manasika Doshas* whose increase (*Vriddhi*) underlies most behavioral disturbances. Excessive stimulation-seeking, novelty-seeking, and reward-oriented behaviors may be correlated with *Raja* predominance, whereas dependency, passivity, cognitive dullness, and impaired self-regulation resemble *Tama* predominance. Persistent digital engagement may therefore contribute to *Raja–Tama* predominance and attenuation of *Sattva*, adversely affecting mental well-being.

This review explores the neurobiological basis of digital reward dependency and examines its conceptual correlation with *Raja–Tama* dominance from an Ayurvedic psychological perspective. The roles of *Prajnaparadha*, *Asatmya Indriyartha Samyoga*, *Sattvavajaya Chikitsa*, and *Ojas* (mental immunity) are discussed as important frameworks for understanding and managing digital-age behavioral disorders.

Keywords: Digital Addiction, Dopaminergic Reinforcement, Behavioral Dependency, *Raja Guna*, *Tama Guna*, *Manasika Dosha*, Ayurvedic Psychology, *Prajnaparadha*, *Sattvavajaya*, *Ojas*

I. INTRODUCTION

The twenty-first century has witnessed an unprecedented expansion of digital technologies. Smartphones, social networking platforms, gaming applications, streaming services, and artificial intelligence-based content delivery systems have fundamentally altered human behavior. Digital devices are now deeply integrated into education, healthcare, business, entertainment, and interpersonal communication [1,3].

Despite their benefits, excessive digital engagement has generated growing concerns regarding behavioral addiction and mental health disturbances. The DSM-5 recognizes Internet Gaming Disorder as a condition requiring further research, and the WHO has included gaming disorder in the ICD-11. Problematic smartphone use and social media addiction are increasingly studied as behavioral addictions sharing neurobiological features with substance-related disorders [2,8].

Behavioral addiction refers to persistent engagement in rewarding non-substance-related activities despite awareness of adverse consequences. Unlike substance

dependence, behavioral addictions primarily involve maladaptive reinforcement mechanisms associated with reward processing, habit formation, and impaired self-control.

Recent literature highlights the role of dopamine-mediated reward reinforcement in social media dependency and excessive digital use. Continuous digital stimulation activates the mesolimbic reward pathway, increasing reinforcement and habitual behavior [1,9]. Excessive engagement may contribute to anxiety, sleep disturbances, emotional dysregulation, reduced concentration, and impaired productivity [4,8].

Ayurveda offers a unique perspective for understanding human behavior through the concepts of *Manas*, *Triguna*, and mental equilibrium. Psychological health depends upon the balanced interaction of *Sattva*, *Raja*, and *Tama* [5–7]. Disturbances in these *Gunas* may influence cognition, emotional regulation, motivation, and behavioral control.

Although existing studies have examined digital addiction and behavioral dependency from modern and Ayurvedic perspectives independently, limited literature directly correlates dopamine-mediated digital reward mechanisms with *Raja–Tama* predominance [10]. Therefore, the present review attempts to establish a conceptual bridge between contemporary neurobehavioral addiction models and classical Ayurvedic psychological principles.

Important Clarification: *Raja* and *Tama* are not direct equivalents of dopamine or any neurotransmitter. Rather, they represent functional psychological constructs that may phenomenologically correspond to behavioral patterns associated with dopaminergic reward systems. This correlation is theoretical and intended to facilitate integrative understanding, not reductionist equivalence.

II. DIGITAL REWARD DEPENDENCY: A NEUROBIOLOGICAL PERSPECTIVE

Dopamine is a neurotransmitter involved in reward processing, motivation, reinforcement learning, attention regulation, and pleasure perception [9]. The mesolimbic reward pathway plays a central role in reinforcing rewarding experiences and motivating repeated behavior [2].

Modern digital platforms are intentionally designed to maximize user engagement through reward-based behavioral mechanisms. Notifications, likes, comments, social validation, gaming achievements, and short-form content provide intermittent rewards that continuously stimulate dopamine release [1,8,11]. It is important to note that individuals are not "addicted to dopamine" itself; rather, they become dependent on the behaviors and rewards that activate dopaminergic reinforcement circuits.

Common sources of digital reward stimulation include:

- Social media platforms
- Short-form video applications
- Online gaming
- Streaming services
- Instant messaging systems
- Digital shopping platforms
- Personalized recommendation algorithms

Repeated activation of reward pathways may gradually increase craving for digital stimulation. Individuals often develop compulsive checking behavior, fear of missing out (FOMO), reduced self-control, and excessive screen engagement [3,8].

III.AYURVEDIC UNDERSTANDING OF MIND AND BEHAVIOR

Ayurveda recognizes *Manas* (mind) as a fundamental component of life and health. Mental well-being depends upon the harmonious functioning of cognition, emotions, sensory perception, memory, and behavioral regulation.

According to Ayurvedic philosophy, psychological functioning is governed by the *Triguna*:

"सत्त्वं रजस्तम इति गुणाः मानसाः स्मृताः"

(*Sattva, Raja and Tama are the three mental Gunas*): *Charaka Samhita, Sutrasthana 1.57*

- Sattva represents clarity, awareness, wisdom, emotional stability, and self-control. It is the normal, healthy state of mind.

- Raja represents activity, desire, ambition, attachment, passion, and restlessness.
- Tama represents inertia, ignorance, confusion, passivity, and diminished awareness.

Concept of Manasika Dosha

"रजस्तमश्च मनसो दोषौ" (*Raja and Tama are the two Manasika Doshas*) *Charaka Samhita, Sutrasthana*

Unlike *Sattva*, which is not a *Dosha* but the normal state of mental equilibrium, *Raja* and *Tama* are considered the two *Manasika Doshas*. Their increase (*Vriddhi*) leads to mental disturbances, whereas their decrease (*Kshaya*) is also undesirable (e.g., complete absence of *Raja* would lead to inertia). A psychologically healthy individual demonstrates predominance of *Sattva* with balanced expression of *Raja* and *Tama*. Excessive *Raja* may lead to impulsivity, craving, and excessive stimulation-seeking, whereas excessive *Tama* may result in cognitive dullness, poor judgment, dependency, and lack of motivation.

From this perspective, digital addiction can be viewed as *Manasika Dosha Vriddhi* – a pathological increase of *Raja* and *Tama* at the expense of *Sattva*.

IV.CORRELATION OF DIGITAL REWARD DEPENDENCY WITH RAJA–TAMA DOMINANCE

The behavioral manifestations observed in digital dependency demonstrate notable similarities with characteristics traditionally attributed to *Raja* and *Tama*.

Digital environments encourage novelty-seeking behavior, reward anticipation, validation craving, and constant stimulation [1,8,11]. These behavioral patterns resemble *Raja* predominance through:

• Restlessness
• Impulsivity
• Craving for engagement
• Desire for validation
• Continuous stimulation-seeking

Prolonged digital engagement often results in:

• Mental fatigue
• Reduced concentration
• Passive consumption
• Loss of productivity
• Cognitive dullness
• Social withdrawal

These manifestations resemble *Tama* predominance. Thus, digital dependency may be viewed as a cyclical process in which *Raja* initiates compulsive engagement while *Tama* sustains dependency through diminished self-regulation and mental inertia [10].

TABLE 1: CORRELATION OF DIGITAL DEPENDENCY WITH AYURVEDIC CONCEPTS

Modern Behavioral Feature	Psychological Manifestation	Ayurvedic Correlation
Continuous checking behavior	Craving and anticipation	*Raja Guna*
Notification dependence	Reward seeking	*Raja Guna*
Compulsive scrolling	Loss of control	*Prajnaparadha*
Excessive screen time	Behavioral dependency	*Raja–Tama* dominance
Mental fatigue	Reduced awareness	*Tama Guna*
Sleep disturbance	Sensory overload	*Asatmya Indriyartha Samyoga*
Emotional instability	Anxiety and irritability	*Raja* aggravation
Reduced productivity	Inertia and passivity	*Tama* predominance

V.PRAJNAPARADHA AND DIGITAL ADDICTION

Classical support:

"धीधृतिस्मृतिविभ्रष्टः कर्म यत् कुरुतेऽशुभम् । प्रज्ञापराधं तं विद्यात् सर्वदोषप्रकोपणम् ॥"

(*One who, due to impairment of intellect, self-control, and memory, performs harmful actions – that is known as Prajnaparadha, which aggravates all Doshas.*) *Charaka Samhita, Sutrasthana 1.102*

Prajnaparadha refers to actions performed despite awareness of their harmful consequences. Impairment of *Dhee* (intellect), *Dhriti* (self-control), and *Smriti* (memory) leads to inappropriate behavioral choices.

Digital dependency frequently demonstrates features of *Prajnaparadha*, such as:

• Excessive social media use despite academic obligations
• Late-night scrolling despite sleep deprivation
• Continuous screen exposure despite eye strain
• Persistent engagement despite emotional distress

Such behaviors indicate impaired self-regulation and contribute to *Raja–Tama* aggravation [10].

VI.ASATMYA INDRIYARTHA SAMYOGA IN THE DIGITAL AGE

Ayurveda describes three forms of improper sensory engagement:

- Atiyoga: Excessive utilization of sensory organs.
- Ayoga: Insufficient utilization of sensory organs.
- Mithyayoga: Improper or perverted utilization of sensory organs.

Digital dependency primarily represents Atiyoga of *Chakshurindriya* (eyes) and *Shrotrendriya* (ears), characterized by prolonged exposure to screens, artificial illumination, rapidly changing visual stimuli, and continuous auditory notifications.

Such excessive sensory stimulation may contribute to:
• Eye strain
• Sleep disturbances
• Headache
• Mental fatigue
• Reduced concentration
• Emotional irritability
From an Ayurvedic perspective, prolonged sensory overload disrupts psychological balance and contributes to behavioral disturbances.

VII.OJAS AND MENTAL IMMUNITY

Continuous digital overstimulation may impair psychological resilience and mental stability. From an Ayurvedic perspective, depletion of *Satva Bala* (mental strength) and *Ojas* (the subtle essence of immunity and vitality) may contribute to reduced coping capacity, emotional instability, and behavioral dependence.

Ojas is not only responsible for physical immunity but also for mental and emotional resilience (*Manasa Bala*). Excessive sensory engagement, sleep deprivation, chronic stress, and *Raja–Tama* aggravation are known to deplete *Ojas*. Consequently, the individual becomes more susceptible to addictive patterns and less capable of self-regulation. Restoration of *Ojas* through *Sattvic* lifestyle, proper sleep, nutrition, and *Sattvavajaya* interventions is therefore an essential therapeutic target in managing digital addiction.

VIII.CONCEPTUAL FIGURE

Flowchart: Pathogenesis of Digital Reward Dependency from an Integrative Perspective

Digital Stimuli (Notifications, likes, infinite scroll, recommendations)
↓
Dopamine release / Reward pathway activation
↓
Reward seeking & craving behavior
↓
Increase of Raja Guna (Manasika Dosha Vriddhi)
↓
Compulsive digital engagement
↓
Prajnaparadha (despite knowing harms)
↓
Sensory overload (Asatmya Indriyartha Samyoga – Atiyoga)
↓
Mental fatigue, sleep disturbance, stress
↓
Increase of Tama Guna (inertia, dullness)
↓
Digital dependency & reduced Sattva
↓
Ojas depletion (impaired mental immunity)
↓

Vulnerability to addiction, anxiety, and cognitive decline

IX.AYURVEDIC PREVENTIVE AND THERAPEUTIC APPROACHES

Ayurveda emphasizes prevention through behavioral regulation and mental discipline.

1. Dinacharya (Daily Routine)
• Early waking
• Structured daily routine
• Scheduled digital breaks
• Reduced nighttime screen exposure
• Physical exercise

2. Yoga
• *Surya Namaskara*, *Tadasana*, *Vrikshasana*, *Bhujangasana*, *Shavasana*

3. Pranayama
• *Nadi Shodhana*, *Anuloma Viloma*, *Bhramari*, *Ujjayi*

4. Meditation – Improves attention regulation, mindfulness, emotional stability, and self-control [10].

5. Strengthened Sattvavajaya Chikitsa (Psychobehavioral Therapy)

Classical *Sattvavajaya* comprises five components (*Charaka Samhita, Sutrasthana 11.54*):

- Jnana (true knowledge about the harmful effects of digital overuse)
- Vijnana (specialized knowledge/insight into one's own triggers and patterns)
- Dhairya (cultivation of courage, patience, and emotional resilience to resist cravings)
- Smriti (memory and mindfulness practices to recall healthy alternatives)
- Samadhi (focused concentration techniques to retrain attention)

Application to digital detoxification:

- *Jnana*: Psychoeducation on reward reinforcement mechanisms and *Manasika Dosha*
- *Vijnana*: Identifying personal digital triggers (e.g., boredom, loneliness)
- *Dhairya*: Building tolerance to digital withdrawal discomfort
- *Smriti*: Mindful phone checking, remembering commitments to disconnect
- *Samadhi*: Deep work, single-tasking, and meditation to overcome fragmentation

TABLE 2: AYURVEDIC INTERVENTIONS FOR DIGITAL DEPENDENCY

Problem	Ayurvedic Interpretation	Intervention
Excessive screen time	*Prajnaparadha*	Behavioral discipline, *Jnana*
Mental restlessness	*Raja* predominance	*Pranayama*, *Dhairya*
Attention deficit	*Manas* imbalance	Meditation, *Samadhi*
Sleep disturbance	*Raja–Tama* aggravation	*Dinacharya*, reduced night screen
Digital craving	*Indriya Asamyama*	*Sattvavajaya Chikitsa* (all 5 components)
Mental fatigue	*Tama* predominance, *Ojas* depletion	Yoga, *Ojas*-restoring diet, *Smriti*

X.DISCUSSION

Digital reward dependency represents a growing behavioral health challenge in modern society. Contemporary neuroscience explains this phenomenon through reward circuitry activation, reinforcement learning, and dopaminergic reinforcement mechanisms. Digital platforms intentionally employ variable reward schedules that continuously reinforce user engagement and habitual behavior.

Ayurveda offers a complementary explanatory framework through the concepts of *Raja–Tama* predominance (as *Manasika Dosha Vriddhi*), *Prajnaparadha*, *Asatmya Indriyartha Samyoga*, and depletion of *Satva Bala* and *Ojas*. The

present correlation should not be interpreted as direct equivalence between dopamine and *Raja Guna*. Dopamine is a neurochemical messenger, whereas *Raja* and *Tama* are functional psychological constructs describing patterns of cognition, motivation, and behavior. The proposed correlation is phenomenological and theoretical, not causal or reductionist.

Nevertheless, significant functional similarities can be observed:

Modern Concept	Ayurvedic Correlation
Reward seeking	*Raja*
Craving	*Raja*
Impulsivity	*Raja*
Dependency	*Tama*
Reduced awareness	*Tama*
Self-regulation	*Sattva*
Behavioral addiction	*Raja–Tama* imbalance (*Manasika Dosha Vriddhi*)
Loss of resilience / burnout	*Ojas* depletion

Digital dependency may therefore be conceptualized as a cyclical process in which *Raja* promotes compulsive engagement and novelty-seeking, while *Tama* sustains dependency through cognitive dullness, passivity, and diminished self-regulation. Over time, this process depletes *Ojas*, further reducing mental immunity and coping capacity.

This integrative understanding provides a broader framework for preventive mental health strategies and highlights the relevance of Ayurvedic psychology in addressing contemporary behavioral disorders.

XI.LIMITATIONS

This review is conceptual in nature and does not establish a causal relationship between neurochemical mechanisms (e.g., dopaminergic reward pathways) and Ayurvedic psychological constructs (*Raja*, *Tama*, *Ojas*, etc.). The correlations proposed are theoretical and based on phenomenological similarities; they require validation through clinical and interdisciplinary research.

Additionally, the *Triguna* framework has multiple interpretations across different classical texts, and the present review adopts the *Charaka* perspective predominantly. There is no direct neurobiological correlate for *Gunas*, and any mapping remains exploratory. Finally, most cited studies on digital addiction are cross-sectional; longitudinal studies are needed to infer directionality.

XII.FUTURE RESEARCH DIRECTIONS

Future research should explore:

1. Triguna-based psychometric assessment in digitally dependent individuals to quantify *Raja–Tama* predominance.
2. Correlation between objective screen time metrics and *Raja–Tama* scores using validated Ayurvedic psychological instruments.
3. Clinical trials on Yoga-based digital detox programs and *Sattvavajaya* interventions (especially the five components) for behavioral addiction.
4. Development of Ayurvedic Digital Detox Protocols integrating *Dinacharya*, *Ojas*-restoring regimens, and sensory withdrawal.
5. Neurophysiological studies integrating EEG, fMRI, or heart rate variability with *Triguna* assessment to explore potential correlates.
6. Longitudinal studies examining whether *Raja–Tama* predominance precedes or follows excessive digital use.
7. Cross-cultural validation of Ayurvedic psychological constructs in the context of behavioral addictions.

XIII.CONCLUSION

Digital reward dependency has emerged as a major lifestyle-related behavioral challenge characterized by compulsive engagement with digital technologies and repeated activation of reward pathways. Contemporary neuroscience explains this phenomenon through dopaminergic reinforcement mechanisms, whereas Ayurveda provides a

complementary framework through *Raja–Tama* predominance (as *Manasika Dosha Vriddhi*), *Prajnaparadha*, *Asatmya Indriyartha Samyoga*, and *Ojas* depletion.

Although neurochemical pathways and *Gunas* represent different explanatory systems, significant functional parallels can be identified. Strengthening *Sattva* and restoring *Ojas* through *Dinacharya*, Yoga, *Pranayama*, Meditation, and the five classical components of *Sattvavajaya Chikitsa* (*Jnana*, *Vijnana*, *Dhairya*, *Smriti*, *Samadhi*) may provide valuable preventive and therapeutic approaches for improving psychological resilience in the digital era. Integrating insights from neuroscience and Ayurvedic psychology may contribute to the development of holistic strategies for managing digital-age behavioral disorders.

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