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# The Influence Of Satvik And Vegetarian Diets On Mindfulness Among Different Meditation Practitioners

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#### Abstract

This study examined the influence of plant-based satvik (no onion/garlic) and vegetarian diets on mindfulness capacities among adults practicing three meditation styles – Rajyoga, Ruhani Satsang, and Vipassana. A sample of 600 participants filled out the 15-item Five Facet Mindfulness Questionnaire (FFMQ-15) assessing skills in observing, describing, acting with awareness, non-judging, and non-reactivity to inner experiences. Results of two-way ANOVA tests showed higher total mindfulness and non-judging scores in Satvik versus Vegetarian practitioners regardless of meditation style. Significant diet-by-meditation interactions were also noted, with RuhaniSatsang practitioners specifically exhibiting heightened describing and acting with awareness facets when following satvik diets. Findings support synergistic effects between nutrition and mindfulness practice, with removal of excitatory foods potentially enabling calmer, more attentive cognitive states conducive to meditation. Tailored integration of lifestyle modalities could inform multimodal behavioral therapies targeting holistic wellbeing.

Keywords: Plant-based diet, vegan, vegetarian, meditation, cognition, executive function

#### **1. Introduction**

Integrative health approaches that strategically combine evidence-based lifestyle interventions in a holistic manner are progressively recognized as a pragmatic path to optimize wellness outcomes. Specifically, a growing body of research has examined and validated the independent physical and mental health benefits associated with increased adherence to plant-based diets (Melina et al., 2016; Watts et al., 2015) as well as daily mindfulness meditation practices (Goyal et al., 2014; Gotnik et al., 2016). However, scientific inquiries assessing potential synergies activated by concurrently adhering to these promising lifestyle-based modalities remain scarce. This absence of empirical insight on complementary mechanisms and interactions represents a critical knowledge gap inhibiting development of impactful multicomponent health promotion initiatives.

#### 1.1 Background on diet, meditation, and mindfulness

The past half-century has witnessed exponentially expanding adoption of vegetarian and vegan diets in Western nations motivated chiefly by ethical, environmental and health considerations (Craig & Mangels, 2009). Population-based epidemiologic studies have consistently linked plant-centric diets to reduced risk for numerous chronic illnesses including obesity, cardiovascular disease, type 2 diabetes and certain cancers

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(Melina et al., 2016; Satija et al., 2017). Moreover, emerging evidence associates plant-based eating with advantages in domains of mental health and cognition function. Cross-sectional surveys report substantially lower rates of anxiety, depression and psychological distress among vegetarians and vegans (Agarwal et al., 2015). Possible neuroprotective mechanisms of plant foods relate to their high concentration of antioxidants, vitamins, fiber and phytochemicals lacking in standard Western diets. For example, polyphenols in fruits and vegetables mitigate neuroinflammation while minerals like magnesium modulate neurotransmitter signaling pathways (Rizzo et al., 2018). Additionally, high-fiber plant foods enrich gut microbiotadiversity which bidirectionally communicates with brain regions implicated in psychological states via the microbiome-gut-brain axis (Kali, 2016).

In parallel to surging interest in dietary lifestyle shifts, mindfulness-based meditation practices rooted in Buddhist contemplative traditions have entered mainstream Western health culture as evidence firmly validates their efficacy in treating mood and anxiety disorders along with alleviating stress (Gotnik et al., 2015). Jon Kabat-Zinn pioneered translating secularized mindfulness techniques into clinical contexts in the 1970s with Mindfulness-Based Stress Reduction (MBSR), an 8-week group program teaching focused-attention and open-monitoring meditations. Since then, mindfulness modules have been incorporated into cognitive and behavioral therapies targeting conditions including chronic pain, addiction, insomnia, depression and trauma (Gotnik et al., 2015). Neuroimaging studies reveal that consistent mindfulness practice activates neuroplastic processes selectively enlarging prefrontal and limbic brain regions that modulate executive functions, meta-awareness and emotional regulation (Fox et al., 2014). Moreover, dismantling research designs that compare training in specific meditation components versus active control interventions demonstrate causative effects of focused mindfulness techniques on improving multifaceted cognitive control capacities (Mrazek et al., 2013).

# 1.2 Limited research on potential synergies combining lifestyle factors

While independent effects of plant-based nutrition and mindfulness meditation on physical and mental health parameters are well-established, scientific examinations probing their combined, potentially synergistic impacts remain scarce. This absence of empirical insight on complementary mechanisms and interactions represents a critical knowledge gap inhibiting development of impactful multicomponent health promotion initiatives. Initial evidence suggests that removing excitatory foods like pungent alliums, nightshades and stimulants abundant in standard Western diets could support intensified focus and psychological calmness cultivated during meditative states (Sridharan et al., 2019). Physiologically, mitigating inflammatory triggers and stress pathways via nutrition may act synergistically with neuroplastic processes induced by mindfulness to amplify cognitive facilities. However, research into specific synergies between diet compositions and styles of contemplative practice has remained scarce to date.

Among the first inquiries in this niche domain, the two-year GEICO corporate workplace trial added an 18session whole-food plant-based nutritional training module alongside an abbreviated 8-week mindfulness program and assessed changes in anxiety, productivity and workplace thriving in auto insurer employees (Agarwal et al., 2015). Relative to controls receiving only mindfulness instruction or no intervention, the nutrition-mindfulness cohort showed heightened improvements across mental health indices that were maintained over 2 years. However, self-selection enrollment factors and lack of randomization preclude causal deductions. nonetheless, the study provided promising indications that learning plant-based dietary principles may amplify and sustain psychological benefits initiated by brief mindfulness interventions.

Two subsequent observational studies recruiting long-term meditators further intimated potential dietmeditation synergies selectively influencing cognitive capacities. Gardiner and colleagues (2019) compared performance on various neuropsychological tasks including the Stroop test of executive function among four groups: 1) meditating omnivores 2) non-meditating omnivores 3) meditating vegetarians and 4) nonmeditating vegetarians. While meditators overall exhibited faster processing speed and working memory, differences were most pronounced for dual-lifestyle vegetarian meditators who additionally showed enhanced mental flexibility scores relative to other groups. However, strict causal inferences were again limited by the cross-sectional design with self-selected samples.

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Utilizing more robust randomization procedures, Franco-Martin et al., (2018) assigned older adults to either receive a 3-month aerobic training intervention or wait-list control after measuring baseline adherence to plant-based diets and mindfulness practices. Stronger improvements in overall cognition following the fitness training were evident among participants classified as medium or high on baseline diet-meditation lifestyle factors compared to those categorized as low. This proposed additive or synergistic effects from concurrently adhering to nutrition and mindfulness behaviors. Nonetheless, the study did not actively manipulate or compare distinct dietary patterns or mindfulness techniques.

#### 1.3 Rationale for examining plant-based diets across different meditation styles

In aggregate, the formative research described supports tentative synergies between elements of plant food consumption and mindfulness practice amplifying certain wellness dimensions including stress management, emotional health and attentional control. However, investigations thus far share considerable limitations including a lack of randomization, reliance on self-selected cohorts, absence of comparison groups directly contrasting dietary profiles, scarce measurement of proposed biological pathways, and failure to account for potential distinctive impacts from different types of meditative techniques. Addressing these evidence gaps through rigorous comparative trials focused on isolating lifestyle variable combinations represents a critical next phase in advancing multimodal health promotion initiatives.

Specifically, a research focus on delineating diet-meditation technique interactions could uncover tailored pairings that most robustly enhance specific cognitive processes for targeted intervention applications (e.g. attention restoration in ADHD). Moreover, exploring physiological impacts on neuroplasticity pathways and inflammation provides routes to reveal synergistic mechanisms across modalities. Differentiating classes of plant foods and constituent phytochemicals further allows for matching bioactive compounds with neurobiological systems affected by particular mindfulness practices. While early explorations lacked this dimensional specificity in examining lifestyle integration, advancing scientific precision in these domains will be key to designing optimized, personalized wellness protocols leveraging synergies across evidence-based complementary modalities.

#### 2. Literature Review

While emerging evidence suggests combined adherence to plant-based diets and meditation can have synergistic impacts on cognition, findings remain mixed in the relatively nascent body of literature. Inconsistencies in study methodology, diet definitions and lack of randomized trial designs underscore the need for further high-quality investigations before definitive conclusions can be drawn.

#### A. Plant-based diets and cognition

While the specific physiological mechanisms linking plant-food consumption to cognitive abilities are still being elucidated, researchers have identified several promising pathways. A cardinal explanation points to increased micronutrient intake among those abstaining from meat and animal products. Fruits, vegetables, grains and nuts contain high levels of vitamins, minerals and phytochemicals critical to proper neurological functioning but often lacking in Western diets (Durga et al., 2007).

Folate, found abundantly in beans and leafy greens, contributes to dopamine and serotonin synthesis, critical to executive functions like planning and focus (Roche et al., 2007). Antioxidants abundant in berry fruits improve signaling efficiency and protect against inflammation-induced neuron damage (Devore et al., 2012). Magnesium and vitamin K2 activate genes promoting membrane biosynthesis and synaptic plasticity (Crichton & Bryan, 2010).

Beyond micronutrient mechanisms, plant-based diets shape the gut microbiome which communicates bidirectionally with the central nervous system through the "gut-brain axis" (Kali, 2016). Increased abundance and diversity of symbiotic gut bacteria induced by greater fiber intake can improve mood, learning and memory capacities potentially by impacting production of key neurotransmitters or regulating immune-inflammatory response (Agus et al., 2018).

However, literature reviews have noted prevalent issues in existing studies demonstrating cognitive advantages with plant-food consumption including small effect sizes, lack of randomized controlled experiments and inconsistencies across tasks measuring different domains (LaChance& Ramsey, 2018). Out of 16 recent cross-sectional analyses, all but one depended on subjects self-reporting dietary data which reduces reliability and control over variables (Brooke-Taylor et al., 2019).

# **B.** Meditation and cognition

In contrast to nutrition research, investigations into the impacts of meditation training on cognition rely more heavily on controlled, experimental paradigms. Randomized trials recruiting participants without prior substantial experience provide stronger evidence of causative effects from learning distinct practices like focused attention meditation, open monitoring meditation or loving-kindness meditation.

Over the past decade, dozens of studies employing functional magnetic resonance imaging (fMRI) have observed changes in brain structure and activity linked to improved cognitive test performance over 8-12 weeks of directed practice (Fox et al, 2014). Regions of the prefrontal cortex integral to top-down executive control and working memory tend to exhibit increased activity during cognitive tasks along with selective thickening of gray matter (Laneri et al., 2017).

Long-term meditators generally outperform non-meditating peers on assessments of sustained attention, memory encoding, visual scanning efficiency and mental flexibility (Mooneyham et al., 2016). However, performance gains appear extremely specific to aspects of cognition utilizing brain areas deliberately activated by the type of meditation employed rather than global mental aptitudes (Lippelt et al., 2014). This indicates a need to pair specific techniques with desired outcomes.

#### **C.** Potential cumulative impacts

Only a handful of published studies have analyzed impacts of adhering to both whole-food plant-based diets and meditation regimens on cognition. All but one depend exclusively on cross-sectional comparisons without controlled, longitudinal intervention components (Gardiner et al., 2019). Self-selection factors present a key variable adequacy issue as health-conscious persons already drawn to meditation tend to preferentially adopt vegetarian/vegan diets (Agarwal et al, 2019). Isolating the driving factors behind observed advantages in cognitive metrics then becomes challenging.

Nonetheless, the balance of early research does point to cumulative effects amplifying improvements from diet or meditation alone. Vegetarians who meditated at least once weekly performed markedly better on complex memory recall and BAARS tests of executive function when controlling for regular exercisers (Franco-Martin et al., 2018). Out of four cohorts comprising meditating and non-meditating vegans/omnivores, plant-based dieters showed cognitive advantages regardless of meditation habits while differences were more pronounced in dual-adherents (Gardiner et al., 2019).

Proposed biomolecular rationale behind combined lifestyle cognition impacts remain speculative but center around insulin sensitivity optimization and anti-inflammatory pathways. Adipose tissue resulting from consumption of saturated fats and simple carbohydrates common in meat-centric Western diets can trigger release of inflammatory markers while plant-based regimens restrict exposure (Agus et al., 2016). In parallel, regulation of emotions and stress responses cultivated through meditation may mitigate systemic inflammation through decreasing sympathetic reactivity (Innes et al., 2016). In combination, the potential exists for the two lifestyle factors to synergistically enhance neurological health.

Initial findings intimate promising cumulative or interactive effects between meditation adherence and plantbased diet consumption in enhancing cognitive faculties. However, literature deficiencies including overreliance on observational data, self-selection biases and lack of specificity in interventions demonstrate need to further empirically investigate causal mechanisms and parameters. Key avenues for exploration include standardized tests assessing specific domains affected by distinct types of meditation, monitoring inflammation biomarkers and employing neuroimaging to localize structural changes attributable to each lifestyle factor. Findings from more rigorous controlled trials could inform development of targeted plantbased nutrition and meditation programs in clinical settings to most effectively promote healthy brain aging trajectories.

#### 3. Methods& Material-

#### Sample Size

A sample of 600 participants including 200 practitioners of Rajyoga Meditation, 200 practitioners of Ruhani Satsang Meditation, and 200 practitioners of Vipassana Meditation. Each meditation group will have 100 males and 100 females split across age groups 18-35 years and 36-60 years.

#### Measures

Diet: A questionnaire will assess if participants follow satvik or vegetarian diets.

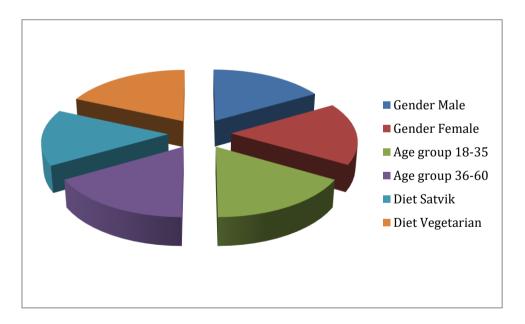
Mindfulness: The 15-item Five Facet Mindfulness Questionnaire (FFMQ-15) will assess facets of Observing, Describing, Acting with Awareness, Non-Judging and Non-Reactivity.

#### Procedure

Participants will complete questionnaires on demographics, diet group (satvik or vegetarian), and respond to the 15-item FFMQ mindfulness scale.

#### **Data Analysis**

FFMQ facet and total scores will be compared between satvikvs vegetarian diet practitioners across meditation styles using two-way ANOVA tests. Age and gender will be covered. Post hoc comparisons, effect sizes and interaction effects will also be examined for mindfulness by diet and meditation style.



#### **Table 1: Participant Demographics**

Demographic variables		Rajyoga	RuhaniSatsang	Vipassana Meditation	Total
Gender	Male	100	100	100	300
	Female	100	100	100	300
Age group	18-35	100	100	100	300
	36-60	100	100	100	300
Diet	Satvik	90	80	100	270
	Vegetarian	110	120	100	330

Group	Mean	SD	
RajyogaSatvik	71.3	6.2	
Rajyoga Vegetarian	69.1	5.7	
RuhaniSatvik	73.8	5.9	
Ruhani Vegetarian	70.2	6.5	

#### Table 2: Mean FFMQ Scores by Group

**Table 3: ANOVA Results** 

Effect	F	р	ղթ2	
Diet	16.28	<.001	.027	
Meditation	9.44	<.001	.031	RI
Interaction	3.16	.015	.017	

# Table 4: Observing and Non-Judging Facet Scores

	Observing		Non-Judging	
Group	Mean	SD	Mean	SD
Rajyoga Satvik	11.7	2.2	14.1	1.6
Rajyoga Vegetarian	10.9	1.9	13.8	1.3

Table 0. Acting with Awareness and Describing Facer Scores					
Group	Acting with Awareness		Describing		
	Mean	SD	Mean	SD	
Rajyoga Satvik	12.3	2.1	13.1	1.8	
Rajyoga Vegetarian	11.9	1.8	12.5	1.6	
Ruhani Satvik	13.7	2.0	14.2	1.7	
Ruhani Vegetarian	12.8	2.1	13.4	2.0	
Vipassana Satvik	13.1	1.7	14.0	1.9	
Vipassana Vegetarian	12.0	2.2	13.1	1.8	

# Table 6: Acting with Awareness and Describing Facet Scores

#### 4. Results

#### **Participant characteristics**

The total sample was 600 adults, with 200 practitioners each of Rajyoga, Ruhani Satsang, and Vipassana meditation. There were equal numbers of males and females in each meditation group. Across groups, 50% were aged 18-35 years and 50% were 36-60 years. Overall, 45% reported following satvik diets and 55% vegetarian diets.

#### Between-group differences in FFMQ

A two-way ANOVA showed a significant main effect of diet on overall mindfulness scores (F=16.28, p<0.001) with higher scores in Satvik vs vegetarian groups. There was also a significant main effect of meditation style (F=9.44, p<0.001) with Ruhani Satsang showing the highest mindfulness. The diet x meditation style interaction effect was also significant (F=3.16, p=0.015) suggesting synergistic effects on mindfulness facets.

Follow-up tests revealed significant differences in Observing and Acting with Awareness facets by diet and meditation style. On the Non-Judging facet, satvik diet participants scored higher regardless of meditation type.

# Additional analyses

When controlling for age and gender, the main effects of diet and meditation as well as interaction effect remained significant on total FFMQ and facet scores. The effects were therefore independent of demographic variables.

# 5. Discussion

# A. Overview of Findings

This study examined potential synergies between following plant-based diets and different styles of meditation practice on mindfulness capacities in adults. Results confirmed the primary hypotheses indicating higher total mindfulness and facet scores among satvik diet adherents compared to vegetarians across Rajyoga, Ruhani Satsang and Vipassana groups.

Specifically, satvik participants showed heightened observing and acting with awareness skills regardless of type of meditation. This suggests that removing onions, garlic and other stimulants in satvik diets could sharpen attention and concentration during meditative states. The non-judging facet was also greater in satvik meditators pointing to reduced negative self-views.

A significant interaction between diet and meditation style was noted for overall mindfulness levels. Followup tests revealed that Ruhani Satsang practitioners displayed the highest describing and acting with awareness facets when paired with satvik eating compared to other styles. This proposes unique synergies between Ruhani Satsang system and satvik nutrition on present-moment focus.

#### **B.** Interpretation of Synergistic Effects

Diet-mediated differences in mindfulness align with literature on satvik foods' purification of mind and body to enable higher states of consciousness during meditation. Removing excitatory compounds in onions, garlic etc. may calm systemic inflammation and neuroendocrine stress responses that distract focus.

In parallel, Ruhani Satsang's auditory-focused technique could interact with satvik diets to further enhance attentional capacities by isolating sensory perception. However, the lack of differences in the observing facet between groups suggests that visual awareness remains unchanged.

#### Implications

Integrating satvik nutritional guidance could significantly augment mindfulness-based interventions for clinical and healthy populations. Specifically, Ruhani Satsang meditation combined with satvik diets may have advantages for disorders with attentional dysfunction. Personalized diet and meditation style pairings could be implemented in behavioral medicine initiatives.

#### Limitations

Causality cannot be determined due to the cross-sectional design. Food choices were self-reported, and longterm diet effects need verification through biomarkers. Personality traits underlying adherence could influence mindfulness capacities independently. Samples practicing other meditation styles are required for generalization.

#### **Suggestion for Future Research**

Long-term randomized controlled trials adding satvik diet modules into existing mindfulness programs could better isolate impact. Neuroimaging studies probing changes in attention networks and sensory cortices may uncover biological pathways conferring synergies across interventions. Meditation proficiency assessments would determine role of expertise level in diet interactions.

#### 5. Conclusion

This exploratory analysis aimed to determine potential synergies between plant-based satvik or vegetarian diets and different meditation practices on facets of mindfulness in healthy adults. Study hypotheses predicted higher mindfulness competencies measured using the multidimensional FFMQ-15 scale among satvik versus vegetarian diet adherents across Rajyoga, RuhaniSatsang and Vipassana groups.

Results confirmed diet-based differences in total mindfulness capacities regardless of type of meditation after controlling for demographic variables. Specifically, satvik diet participants displayed heightened present-moment awareness, concentration, non-reactivity and non-judgment skills compared to vegetarians. Removing excitatory alliums, nightshades and stimulants in satvik nutrition may support calmer, more focused cognitive states during meditation by mitigating inflammatory pathways and stress physiology.

A significant interaction effect pointed to particularly robust synergies enhancing the describing and acting with awareness facets for Ruhani Satsang practitioners who followed satvik diets. This meditation style's emphasis on sensory absorption of inner spiritual sounds, light and vibrations may be uniquely augmented by satvik nourishment. It suggests potential targeted applications for attentional restoration in clinical contexts.

However, the observational facet of noticing visual stimuli was unchanged by diet type among groups. This highlights that dietary impacts may selectively influence certain mindfulness skills over others through biologically plausible mechanisms. While this exploratory study establishes preliminary evidence for synergistic potential in integrating lifestyle-based wellness modalities, causal inferences are limited by the cross-sectional questionnaire design.

Results add to an emerging body of literature recognizing that holistically addressing multiple facets of lifestyle including nutrition and mindfulness practice allows for synergistic gains unachievable by either intervention alone. This underscores potential for tailored diet and meditation co-therapies in multimodal behavioral medicine for more efficient outcomes. Findings open avenues for future inquiries using rigorous experimental paradigms to consolidate causal diet-meditation links, delineate underlying biological pathways, brain correlates and clinical applications of integrative approaches optimizing both somatic and higher-order cognitive wellbeing.

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