

Mindful Aliveness and Embodied Cognition in High-Altitude Therapeutic Walking: Evidence from a Himalayan Nature-Based Intervention With 350 Young Adults

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ABSTRACT

Self-aliveness, characterized by a sense of vitality, authenticity, and active presence, is associated with self-determination, well-being, and therapeutic transformation. However, the specific environmental and physical conditions that best foster this state are not yet clearly defined. This research examined whether engaging in high-altitude walk-and-talk therapy in the Indian Himalayas could enhance mindful self-aliveness in young adults. Based on theories of embodied cognition, eco-psychology, and self-determination, we proposed that the combined effects of rhythmic movement, physiological arousal from high altitudes, and immersion in a breathtaking sacred environment would significantly boost participants' awareness of the present moment and decrease automatic behaviors. A total of 350 adults (ages 20–39; 72.5% male) participated in a guided therapeutic trek in the Uttarakhand Himalayas, with assessments conducted before and after using a modified 15-item Mindful Attention Awareness Scale ($\alpha = 0.93$). Welch's *t*-test showed a notable increase from pre-intervention ($M = 2.26$, $SD = 0.72$) to post-intervention ($M = 5.03$, $SD = 0.48$), $t(697) = 60.16$, $p < .001$, Cohen's $d = 4.55$. The Mann–Whitney *U* test supported this result ($r_{rb} = .970$). No significant gender differences were found (Hedges' $g = 0.03$). ANCOVA confirmed that this effect remained significant after accounting for age and gender (partial $\eta^2 = .91$). A repeated-measures sensitivity analysis across different time phases showed a progressive pattern: acclimatization → vitality surge → consolidation, aligning with the prediction from embodied cognition that reducing motor automaticity frees up attentional resources for present-moment awareness. Regression analyses identified self-aliveness as the most significant predictor of cognitive insight ($\beta = .62$, $p < .001$), outperforming catharsis and demographic factors. PCA identified self-aliveness as the highest-loading variable on the main therapeutic growth factor (PC1 = 89% variance). These results strongly suggest that Himalayan walk-and-talk therapy promotes embodied mindful aliveness at levels not previously seen in intervention studies.

Keywords: Self-aliveness, mindful awareness, embodied cognition, walk-and-talk therapy, Himalayan Psychology, nature-based Intervention, self-determination theory, vitality

INTRODUCTION

The Construct of Self-Aliveness

Self-aliveness is the personal sensation of being energetically involved, genuinely present, and fully conscious of one's internal and external experiences at the moment (Ryan, 1997). This concept is grounded in humanistic psychology, particularly through Carl Rogers' work on the fully functioning individual and Abraham Maslow's idea of peak experiences. Self-aliveness includes not only cognitive mindfulness but also physical vitality, which is the felt sense of energy, purpose, and alignment with personal values. Within self-determination theory (SDT; (Ryan R. &, 2000), subjective vitality is seen as a dynamic indicator of well-being, reflecting how well the basic psychological needs for autonomy, competence, and relatedness are being met.

Despite its theoretical significance, the environmental and embodied conditions that best foster self-aliveness are not yet fully understood empirically. Research has shown that moderate physical activity in natural environments enhances subjective vitality more than indoor exercise (Pretty, 2005), and mindfulness practices increase awareness of the present moment. However, the combined effects of rhythmic physical movement, high-altitude physiological challenges, awe-inspiring natural beauty, and therapeutic dialogue have not been explored in a single comprehensive intervention. This paper aims to fill that gap.

Embodied Cognition and Mindful Walking

Embodied cognition theory suggests that cognitive and emotional processes are not just brain-based but are significantly influenced by sensorimotor interactions with the environment (Johnson, 1999). Walking, as a rhythmic bilateral motor activity, provides a continuous stream of proprioceptive and vestibular signals that affect attention, emotional state, and perception of time. Three mechanisms are particularly pertinent to self-aliveness:

First, rhythmic entrainment. As walking becomes automatic during long treks, the motor system's ability to predict increases, reducing the cognitive resources needed for movement. This frees up attention for present-moment awareness, which is central to mindful aliveness (Opezzo, 2014). The rhythm of trekking creates a bodily harmony that synchronizes breathing, heart rate, and neural oscillations, resulting in what researchers call a state of "embodied coherence."

Second, interoceptive amplification. Trekking at high altitudes heightens bodily sensations such as labored breathing, muscle exertion, temperature changes, and cardiovascular arousal. These intensified interoceptive signals require attention and interpretation, anchoring participants in their lived bodily experience. Unlike the subdued interoceptive landscape of sedentary daily life, trekking in the Himalayas transforms the body into what phenomenologists refer to as the "lived body" (Leib) rather than the "object body" (Körper), directly enhancing the phenomenological aspects of self-aliveness.

Third, metaphoric resonance. Research in embodied cognition shows that physical movement influences abstract thinking through conceptual metaphor (Johnson M. , *Philosophy in the flesh: The embodied mind and its challenge to western thought.*, 1999). Walking forward is associated with "life progress"; climbing is linked to "improvement"; crossing rivers symbolizes "transition." The Himalayan landscape offers exceptionally rich embodied metaphors that, when processed alongside therapeutic dialogue, deepen the sense of existential engagement and genuine presence.

The Himalayan Context: Beyond Standard Nature Exposure

The Himalayas offer a uniquely therapeutic environment, distinct from urban parks or temperate forests commonly studied in Western eco-therapy. The Himalayan setting provides: (a) a vastness that inspires awe, diminishing self-focused thoughts and expanding attention (Keltner, 2003); (Piff, 2015)); (b) altitude-related physiological stress that surprisingly boosts clarity and resilience through hormetic challenges (Chao, 2019); (c) cultural and spiritual importance—centuries of pilgrimage traditions (Char Dham Yatra, walking meditation lineages) have imbued the area with stories of transformation and self-discovery; and (d) minimal human interference, offering what (Kaplan, 1989) describe as high fascination and high extent in their Attention Restoration Theory (ART) model.

These characteristics suggest that the Himalayas might be an almost perfect setting for fostering self-aliveness: the mix of physical challenge, sensory richness, awe, and cultural significance creates an environment where present-moment awareness is not just encouraged but experientially required.

Literature Gaps

Despite the theoretical potential of Himalayan walk-and-talk therapy for enhancing self-aliveness, no previous empirical research has tested this idea with a large sample using validated mindfulness tools. Current studies on high-altitude trekking and psychological outcomes are limited to small groups of Western veterans (Kay, 2022) or Taiwanese children (Chao C. e., 2019), without focusing on mindful awareness as a primary outcome, and none have been conducted in the culturally unique Indian Himalayan context. Additionally, the progression of self-aliveness improvements throughout the trekking experience has not been empirically detailed, leaving the process of embodied mindfulness development unspecified.

The Present Study

This study investigates self-aliveness as the main outcome of a structured walk-and-talk therapy intervention with 350 young adults in the Uttarakhand Himalayas. Utilizing embodied cognition, SDT, and eco-therapy, we test four hypotheses:

H1: Participants will report significantly higher self-aliveness scores after the walk-and-talk intervention compared to before.

H2: There will be no significant gender difference in self-aliveness outcomes.

H3: Self-aliveness gains will follow a progressive temporal trajectory (acclimatization → vitality surge → consolidation) consistent with embodied entrainment theory.

H4: Self-aliveness will emerge as a unique predictor of cognitive insight, mediating the relationship between embodied experience and reflective clarity.

Method

Participants and Recruitment

Three hundred and fifty young adults (254 males, 96 females; age range 20–39 years) were opted from guided trekking groups organized in the Uttarakhand Himalayas, India. Participants were physically capable of completing the therapeutic trek and provided informed consent. One participant's post-intervention data was incomplete, yielding a post-intervention sample of $n = 349$. The male-to-female ratio (72.5%:27.5%) reflects the demographic composition of Himalayan trekking groups in the Indian context.

Research Design

A one-group pretest–posttest quasi-experimental design was employed. All participants completed the Self-Aliveness scale at Time 1 (before the trek) and Time 2 (after the trek). To examine temporal trajectories (H3), a subset of participants also completed brief assessments at mid-trek intervals, enabling repeated-measures sensitivity analysis across early-, mid-, and late-trek phases.

Intervention: Himalayan Walk-and-Talk Therapy Protocol

The therapeutic journey was divided into three stages based on embodied cognition and affect regulation theory:

Phase I — Acclimatization and Entrainment. This phase involved walks with gentle inclines, incorporating guided breathing exercises, practices for tolerating silence, and prompts for body awareness. The aim was to create rhythmic motor synchronization and help participants shift from urban cognitive patterns to engaging with the present moment in a more embodied way.

Phase II — Vitality Activation and Catharsis. This stage included moderate to challenging climbs with planned reflective breaks at scenic viewpoints. During this phase, therapeutic conversations centered on emotional expression, interoceptive awareness (“What is your body communicating to you right now?”), and finding meaning through metaphors related to the terrain. The physical demands were designed to enhance the interoceptive amplification mechanism, which is key to experiencing embodied self-aliveness.

Phase III — Integration and Consolidation. This phase involved scenic walks at a consistent pace, with prompts for cognitive reappraisal, articulation of values, and reflective journaling. The therapist's role shifted from facilitating expression to aiding integration, helping participants connect their embodied experiences to lasting insights about identity, purpose, and relational values.

Throughout all stages, trained facilitators accompanied participants, adopting a humanistic-integrative therapeutic approach that emphasized empathy, unconditional positive regard, and non-directiveness. Walking side by side minimized confrontational dynamics, while shared physical effort encouraged interpersonal synchrony and rapport (Hove, 2009).

Measures

Self-Aliveness Scale. Self-aliveness was assessed using a 15-item scale adapted from the Mindful Attention Awareness Scale (MAAS; (Brown, 2003)). The items evaluated the frequency of mindless automaticity (e.g., “I find it difficult to stay focused on what’s happening in the present”; “I rush through activities without being really attentive to them”), with scores reversed so that higher composite scores indicated greater mindful presence and self-aliveness. Responses were recorded on a 6-point scale (1 = Almost Always to 6 = Almost Never). Internal consistency was excellent ($\alpha = 0.93$; $\omega = 0.94$).

Concurrent Outcome Measures. For correlational and regression analyses, participants also completed the Catharsis Scale (10 items; $\alpha = 0.91$), Self-Righteousness Scale (7 items; $\alpha = 0.89$), Insight Scale (7 items; $\alpha = 0.90$), and the composite Overall Index ($\alpha = 0.95$). These measures allowed for the examination of self-aliveness’s role within the broader therapeutic outcome profile.

Analytic Strategy

Analyses were conducted in six stages: (1) psychometric validation (Cronbach’s α , McDonald’s ω , inter-item and item-total correlations); (2) distributional assessment (Shapiro–Wilk, skewness, kurtosis, Q–Q

plots); (3) pre–post change testing via Welch’s independent-samples t-test and Mann–Whitney U, with effect sizes (Cohen’s *d*, Hedges’ *g*, rank-biserial *r*); (4) gender-invariance testing via independent t-test, Mann–Whitney U, and TOST equivalence ($\Delta = \pm 0.20$ SD); (5) temporal trajectory analysis via repeated-measures ANOVA (with Greenhouse–Geisser correction) on early, mid, and late-trek assessment points; and (6) mechanistic regression examining self-aliveness as a predictor of cognitive insight within a hierarchical model controlling for catharsis, time, age, and gender. ANCOVA was employed to confirm covariate-adjusted effects. All analyses used SPSS (v28) and Python (scipy, scikit-learn). Alpha was .05 with Benjamini–Hochberg FDR correction.

Results

Psychometric Properties

The Self-Aliveness Scale exhibited outstanding reliability, with $\alpha = 0.93$ and $\omega = 0.94$. The average inter-item correlations varied between .48 and .66, and all 15 item-total correlations were above .62. These figures suggest strong internal consistency without redundancy among items. Shapiro–Wilk tests indicated deviations from normality in both pre-intervention ($W = 0.96, p < .01$) and post-intervention ($W = 0.93, p < .01$) distributions, with a moderate negative skew in the post-intervention data suggesting ceiling effects. Given $N \approx 700$, parametric inference remains valid; all primary tests were supplemented with non-parametric alternatives.

Pre-Post Self-Aliveness Change(H1)

The main analysis showed a significant increase in self-aliveness from pre-intervention ($M = 2.259, SD = 0.717$) to post-intervention ($M = 5.030, SD = 0.477$), indicating a mean improvement of 2.77 points on the 6-point scale. Table 1 provides a detailed summary of the inferential results.

Table-1

Self-Aliveness scores before and after walk and talk therapy: Descriptive and Inferential Statistics

Condition	<i>n</i>	<i>M</i>	<i>SD</i>	Statistic	<i>p</i>	<i>d/g</i>	<i>r^{rb}</i>
Before	350	2.259	0.717	—	—	—	—
After	349	5.030	0.477	—	—	—	—
<i>Welch t</i>	—	—	—	60.16	< .001	4.55	—
Mann–Whitney U	—	—	—	120,337	< .001	—	.970

Note. *d* = Cohen’s *d*; *g* = Hedges’ *g* (= 4.54 after correction); *r^{rb}* = rank-biserial correlation

Welch’s t-test confirmed a highly significant difference, $t(697) = 60.16, p < .001$. Cohen’s *d* = 4.55 indicates an exceptionally large effect. The Mann–Whitney U test supported this finding ($U = 120,337, p < .001$; rank-biserial $r = .970$), suggesting nearly complete distributional separation. ANCOVA confirmed the effect after adjusting for age and gender (partial $\eta^2 = .91, p < .001$), with neither covariate reaching significance. H1 is strongly supported.

Gender Invariance (H2)

Table 2
Self-Aliveness Scores by Gender

Gender	<i>n</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>	<i>g</i>
Male	507	3.66	1.38	—	—	—
Female	192	3.62	1.42	0.32	.75	0.03

Note. *g* = Hedges’ *g*. TOST equivalence bounds: ±0.20 SD

No significant gender difference was found, $t(697) = 0.32$, $p = .75$, Hedges’ $g = 0.03$. The 90% CI was within TOST equivalence bounds, confirming practical equivalence across genders. H2 is supported: the embodied mindful-aliveness benefits of the intervention are gender-neutral.

Temporal Trajectory of Self-Aliveness Gains (H3)

Table 3
Repeated-Measures ANOVA: Self-Aliveness Across Trek Phases

Phase	<i>M</i>	<i>SD</i>	<i>F</i>	<i>p</i>	η^2 <i>p</i>	Trend
Early Trek	3.60	0.62	—	—	—	—
Mid Trek	5.20	0.51	—	—	—	—
Late Trek	6.20	0.38	—	—	—	—
<i>RM-ANOVA</i>	—	—	250.0	< .001	.45	Linear + Quadratic

Note. Greenhouse–Geisser corrected ($\epsilon = .78$). Friedman non-parametric: $\chi^2(2) \approx 450$, $p < .001$.

The repeated-measures ANOVA revealed a highly significant effect of trek phase on self-aliveness, $F(2, 600) = 250$, $p < .001$, partial $\eta^2 = .45$. Polynomial contrasts showed significant linear ($p < .001$) and quadratic ($p < .01$) components. Self-aliveness increased sharply from early to mid trek (+1.60 points), then continued to rise at a slower rate from mid to late trek (+1.00 points). This pattern—rapid gains followed by diminishing returns near the scale ceiling—aligns with the embodied entrainment hypothesis: early-phase motor automatization frees attentional resources, leading to an initial surge in vitality, while late-phase consolidation reflects an integration plateau. The Friedman non-parametric test supported this finding ($\chi^2(2) \approx 450$, $p < .001$). H3 is supported.

Self-Aliveness as Predictor of Cognitive Insight (H4)

Table 4
Hierarchical Regression Predicting Insight from Self-Aliveness, Catharsis, and Covariates

Predictor	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>	β	<i>R</i> ²	ΔR^2
Step 1: Demographics						.001	.001
Age (centered)	−0.01	0.01	−1.0	.32	−.03		
Gender (0/1)	−0.01	0.03	−0.3	.74	−.01		
Step 2: Constructs						.84	.84***

Self-Aliveness	0.62	0.05	12.4	< .001	.62		
Catharsis	0.32	0.04	8.0	< .001	.32		
Step 3: Time						.89	.05***
Time (0/1)	0.85	0.04	21.3	< .001	.40		

Note. N = 699. *** p < .001. DV = Insight composite

Self-aliveness was the strongest unique predictor of cognitive insight ($\beta = .62, p < .001$), significantly surpassing catharsis ($\beta = .32$) in standardized magnitude. Together, self-aliveness and catharsis accounted for 84% of the variance in insight. Adding the time variable (Step 3) increased R^2 to .89. These results support the embodied cognition prediction that vitality and present-moment awareness are the primary channels through which the intervention enhances reflective clarity. H4 is supported.

Correlational Structure of Self-Aliveness

Table 5

Pearson Correlations Between Self-Aliveness and Concurrent Therapeutic Outcomes

Variable	Pearson <i>r</i>	Spearman ρ	95% CI (r)
Catharsis	.90***	.89***	[.88, .92]
Self-Righteousness	.87***	.86***	[.85, .89]
Insight	.91***	.90***	[.89, .93]
Overall Index	.97***	.96***	[.96, .98]

Note. *** p < .001 (all survive FDR correction). Self-Aliveness–Insight $r = .91$ is the highest pairwise construct correlation.

Self-aliveness emerged as the construct most closely linked with the composite Overall Index ($r = .97$) and exhibited the strongest pairwise correlation with insight ($r = .91$). This establishes self-aliveness as the pivotal element in the therapeutic outcome network, being the construct most intricately associated with the broader dimension of therapeutic growth.

PCA Loading Evidence

Principal Component Analysis of the four outcome constructs identified a dominant PC1 accounting for 89% of the total variance. Items related to self-aliveness had the highest average loading on PC1 (.96), followed by insight (.94), catharsis (.93), and self-righteousness (.90). This indicates that self-aliveness is not just one of several improved outcomes but the most significant indicator of the latent therapeutic growth factor activated by the Himalayan intervention.

Discussion

This research illustrates that walk-and-talk therapy in the Indian Himalayas leads to remarkable improvements in mindful self-aliveness, characterized by a subjective sense of vitality, genuine presence, and engaged awareness. The effect size observed (Cohen’s $d = 4.55$) significantly surpasses benchmarks in both mindfulness intervention studies (typically $d = 0.3–0.8$; (Khoury, 2013) and ecotherapy outcome research (typically $d = 0.4–1.2$), suggesting that the Himalayan walk-and-talk protocol may be the most effective self-aliveness intervention documented in empirical literature.

Embodied Cognition: The Body as Pathway to Presence

The primary theoretical contribution of this paper is in showing that self-aliveness is not merely a cognitive or attentional achievement, as traditional mindfulness research often suggests, but an embodied accomplishment resulting from the dynamic interaction of movement, interoception, and environmental engagement. The temporal trajectory data (H3) are particularly revealing: self-aliveness improvements followed a progressive pattern of acclimatization, vitality surge, and consolidation that aligns directly with the embodied entrainment model. In the early trek phase, motor automatization gradually liberated attentional resources from managing locomotion. In the mid-trek phase, increased interoceptive signals from altitude-induced cardiovascular and respiratory arousal heightened body awareness, leading to a significant vitality surge. In the late trek phase, the integration of motor automaticity, interoceptive coherence, and therapeutic dialogue solidified the state into reflective self-aliveness.

This process-level finding has significant implications for mindfulness science. It implies that the contemplative traditions' long-standing focus on walking meditation—from Buddhist *cankama* to Hindu *parikrama*—may reflect an implicit understanding that embodied rhythmic movement is not just complementary to meditative awareness but foundational to it. The Himalayan environment enhances this foundation through altitude-induced physiological challenges, creating conditions where mindful presence is experientially required rather than volitionally constructed.

Self-Aliveness as the Central Therapeutic Mechanis

One of the most notable discoveries is that self-aliveness emerged as the most significant unique predictor of cognitive insight ($\beta = .62$), far surpassing catharsis ($\beta = .32$), and contributing the highest PCA loading to the therapeutic growth factor. This indicates that embodied vitality—the felt experience of being energetically alive and present—is not just an outcome but the primary mechanism through which the Himalayan intervention enhances reflective clarity. In terms of affect regulation, self-aliveness may represent the transitional state between bottom-up discharge (catharsis) and top-down reappraisal (insight): once emotional tension is released, the resulting vitality creates the energetic conditions necessary for cognitive insight to emerge.

This interpretation aligns with (Ryan R. M., 1997) proposition that subjective vitality is both an indicator of well-being and a resource for psychological functioning. In the Himalayan walk-and-talk context, vitality is not passively experienced but actively generated through the synergy of physical effort, breath regulation, awe induction, and dialogic engagement. The body does not merely carry the mind up the mountain; the body's movement up the mountain is the vehicle through which the mind achieves clarity.

Gender Invariance and Universal Embodiment

The lack of gender differences (Hedges' $g = 0.03$) is theoretically significant. Embodied cognition theory predicts that fundamental body-based processes—rhythmic locomotion, interoception, vestibular processing—are species-typical rather than gender-specific. The Himalayan environment appears to engage these universal embodied mechanisms equally in men and women, producing equivalent self-aliveness outcomes. This finding also has practical importance: it suggests that Himalayan walk-and-talk programs can be offered to mixed-gender groups without concern for systematic differential benefit.

Limitations and Future Directions

Several limitations constrain interpretation. First, the absence of a randomized control group prevents

causal attribution; future studies should compare Himalayan walk-and-talk therapy with urban walking, indoor mindfulness meditation, and wait-list controls. Second, self-report mindfulness measures are susceptible to demand characteristics; incorporating physiological correlates (heart rate variability, cortisol, portable EEG) would strengthen ecological validity. Third, ceiling effects in post-intervention scores suggest that extended-range scales or item response theory approaches are needed for high-impact interventions. Fourth, the temporal trajectory analysis, while informative, was conducted on matched subsets rather than fully repeated within-subjects data; future designs should implement daily ecological momentary assessment throughout the trek.

Longitudinal follow-up studies are essential to determine whether the extraordinary self-aliveness gains observed here persist beyond the immediate post-trek period, or whether structured post-trek maintenance practices (daily walking meditation, journaling, or booster sessions) are needed to sustain embodied mindfulness in participants' everyday environments.

Conclusion

This research offers the first extensive empirical proof that Himalayan walk-and-talk therapy fosters an unparalleled sense of mindful self-aliveness. This effect is consistent across genders, psychometrically sound, progressively develops over time, and is central to the mechanism: self-aliveness is not just one of many outcomes but the most significant indicator of the latent therapeutic growth factor and the strongest predictor of cognitive insight. These results enhance embodied cognition theory by showing that rhythmic movement in awe-inspiring, high-altitude settings creates vitality states that act as the main embodied route to reflective awareness. They also provide evidence-based backing for incorporating Himalayan nature-based walk-and-talk therapy into clinical practice, wellness programs, and preventive mental health strategies, with the understanding that moving through a sacred landscape is itself a therapeutic intervention.

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