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Personality as a Core Organizing Factor in Mind–Body Health: A Computational Modeling Study

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A B S T R A C T

This study aimed to examine whether personality traits function as a core organizing system underlying mind–body health by integrating multivariate and computational modeling approaches. A cross-sectional design was employed with an adult sample recruited from Portugal. Participants completed validated self-report instruments assessing personality traits and multiple domains of mind–body health, including physical and mental health, perceived stress, affective balance, and sleep quality. Data were first examined using descriptive statistics and correlational analyses to establish basic relationships among variables. Structural equation modeling was then applied to test a theoretically informed model in which personality traits predicted latent dimensions of mind–body health. To complement explanatory analyses, machine learning techniques, including linear and non-linear predictive models, were used to estimate the extent to which personality traits could predict composite mind–body health outcomes. Model performance was evaluated using explained variance and error indices, and feature importance analyses were conducted to identify the relative contribution of each personality trait. Inferential analyses revealed significant and systematic associations between personality traits and all major mind–body health indicators. Neuroticism emerged as a strong positive predictor of stress, negative affect, and sleep disturbances and a strong negative predictor of physical and mental health, whereas Conscientiousness showed the opposite pattern, functioning as a robust protective factor. Structural equation modeling demonstrated that personality traits exerted simultaneous and differential effects on latent health, stress–affect, and sleep regulation factors, with excellent model fit indices. Machine learning models significantly outperformed traditional linear regression, indicating non-linear and interactive relationships between personality and health, with Neuroticism and Conscientiousness showing the highest predictive importance. The findings support the conceptualization of personality as a central organizing factor in mind–body health, shaping the structure, regulation, and predictability of physical and psychological well-being, and highlight the value of computational approaches for advancing integrative psychosomatic models.

Keywords: *personality traits; mind–body health; psychosomatic modeling; computational psychology; machine learning*

1. Introduction

The relationship between personality and health has long occupied a central position in psychosomatic medicine, health psychology, and behavioral sciences. Contemporary research increasingly recognizes that health outcomes cannot be adequately understood through isolated biological or psychological variables, but rather through integrative frameworks that account for stable personality structures, emotional regulation processes, cognitive styles, and physiological responses. Within this context, personality is no longer viewed merely as a background trait constellation but as an active, organizing system that shapes how individuals perceive, interpret, and respond to bodily sensations, stressors, illness, and recovery processes (Krause & Forgon, 2025; Xu et al., 2024). This reconceptualization has profound implications for understanding mind–body health as a dynamic, system-level phenomenon.

Psychosomatic research has consistently demonstrated that personality traits are systematically associated with vulnerability to somatic symptoms, illness progression, coping patterns, and treatment outcomes. Empirical evidence indicates that individuals with specific personality profiles exhibit distinct patterns of symptom perception, autonomic reactivity, immune functioning, and health-related behaviors (Šnele et al., 2024; Vespa et al., 2024). For example, heightened emotional reactivity, maladaptive coping, and chronic stress appraisal have been repeatedly linked to increased somatic complaints and poorer quality of life, whereas adaptive personality configurations appear to buffer stress and support physiological regulation (Fino et al., 2021; YilmaztÜRk et al., 2022). These findings suggest that personality operates as a regulatory architecture through which psychological and physiological systems interact.

A growing body of clinical and epidemiological research highlights the relevance of personality in diverse medical contexts, including oncology, gastrointestinal disorders, chronic pain, dental health, and psychosomatic rehabilitation. Studies conducted in clinical populations demonstrate that personality traits influence symptom reporting, adherence to treatment, patient–provider interactions, and rehabilitation success (Alvenfors et al., 2022; Bajestani et al., 2022; Riedl et al., 2023). For instance, psychosomatic assessments that integrate personality dimensions provide superior explanatory power compared to symptom-focused approaches alone, underscoring the need for holistic models that capture the psychological organization underlying bodily experiences (Gostoli et al., 2021; Papst & Köllner, 2022).

At the same time, research in global health psychology has emphasized that mind–body health emerges from complex interactions among affective states, stress processing, sleep regulation, social functioning, and behavioral patterns. Large-scale studies show that clustering of psychological distress, social pain, and physical discomfort predicts long-term morbidity and mortality, further supporting the notion that health is an emergent property of interconnected systems rather than isolated variables (Kroenke et al., 2021; Macía et al., 2022). Personality traits play a critical role in shaping these interconnections by influencing emotional intelligence, attentional biases, coping strategies, and self-regulation capacities (Galanis et al., 2024; Jin et al., 2023; Rowe et al., 2021).

Despite the robustness of these associations, much of the existing literature remains fragmented, often examining single traits or isolated health outcomes using linear statistical approaches. Such methods, while informative, are limited in their capacity to model the non-linear, reciprocal, and multilevel interactions that characterize mind–body systems. Recent advances in computational psychiatry, machine learning, and network modeling have opened new avenues for conceptualizing personality as a core organizing factor that shapes health through dynamic patterns rather than simple cause–effect pathways (Papst & Köllner, 2022; Pylypenko et al., 2022; Ramos-Vera et al., 2022). These approaches allow researchers to move beyond reductionist models and toward integrative representations of psychological and physiological functioning.

From a theoretical standpoint, personality can be understood as a stable yet adaptive system that organizes perception, emotion, cognition, and behavior across contexts and over time. This systems-oriented view aligns with contemporary psychosomatic models that emphasize meaning-making, narrative identity, and subjective experience as central components of health and illness (Bastholm, 2024; Saadat et al., 2023). Patient narratives, emotional schemas, and interpretive frameworks are not epiphenomena but fundamental mechanisms through which bodily signals are amplified, regulated, or transformed into symptoms (Philippova et al., 2023; Yagudin, 2025). Consequently, personality is increasingly conceptualized as a meta-structure that coordinates mind–body integration.

Empirical studies across cultures and populations further reinforce the universality of personality–health linkages

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while also highlighting contextual variability. Research involving healthcare professionals, students, athletes, and patients with chronic conditions demonstrates that personality traits consistently predict stress responses, psychosomatic symptoms, and functional outcomes, albeit with variations shaped by environmental demands and sociocultural factors (Piepiora et al., 2022; Pilafas & Lyrakos, 2021; Yokoyama & Bando, 2023). These findings support the need for models that are both structurally robust and sensitive to individual and contextual differences.

Another important dimension of mind–body health is the role of attachment, trust, and relational dynamics, which are closely intertwined with personality organization. Studies indicate that attachment-related traits and epistemic trust significantly influence help-seeking behavior, treatment engagement, and psychosomatic recovery (Lu et al., 2022; Riedl et al., 2023). Similarly, emotion-focused coping styles and stress appraisal processes mediate the relationship between personality traits and health-related behaviors, such as emotional eating, health compliance, and symptom monitoring (Tan et al., 2021; YilmaztÜRk et al., 2022). These mediational pathways further underscore the organizing role of personality within broader biopsychosocial systems.

Recent research has also expanded the scope of personality–health studies to include emerging constructs such as neurointuitive intelligence, emotional intelligence, and integrative health diagnostics. These constructs bridge traditional personality theory with neuroscience, psychophysiology, and artificial intelligence, offering novel perspectives on how individuals intuitively regulate bodily states and emotional experiences (Galanis et al., 2024; Myrzabayev et al., 2023; Yagudin, 2025). Such developments highlight the growing convergence between computational modeling and psychosomatic theory.

Despite these advances, there remains a critical gap in the literature regarding comprehensive models that explicitly position personality as the central organizing axis of mind–body health using computational methods. Many studies rely on correlational designs or focus on narrow clinical outcomes, limiting their ability to capture systemic interactions and predictive patterns. Moreover, few investigations integrate traditional psychometric assessments with modern computational techniques to examine how personality structures collectively shape multidimensional health profiles across populations (Wong et al., 2021; Wormgoor & Rodenburg, 2021; Xu et al., 2024). Addressing this gap is essential for advancing both theoretical understanding and practical applications in personalized and preventive healthcare.

In response to these limitations, the present study adopts a computational modeling approach to investigate personality as a core organizing factor in mind–body health. By integrating validated personality assessments with multidimensional indicators of physical health, psychological well-being, stress, affect, and sleep, and by applying both explanatory and predictive analytic frameworks, this study seeks to elucidate the structural and functional role of personality within complex health systems. Grounded in contemporary psychosomatic theory and informed by advances in computational psychology, this research aims to provide an integrative, system-level understanding of how personality organizes mind–body health in adults.

The aim of this study is to model personality as a core organizing factor of mind–body health using computational and multivariate approaches in an adult population.

2. Methods and Materials

2.1. Study Design and Participants

This study employed a cross-sectional, observational design with an emphasis on computational modeling to examine personality as a core organizing factor in mind–body health. The target population consisted of adults residing in Portugal. Participants were recruited through a combination of online announcements distributed via university mailing lists, community forums, and social media platforms, as well as offline advertisements placed in community centers and primary healthcare facilities. Inclusion criteria required participants to be at least 18 years old, fluent in Portuguese, and capable of providing informed consent. Individuals with self-reported severe neurological disorders or acute psychiatric conditions that could substantially impair questionnaire completion were excluded to ensure data reliability. The final sample was designed to be heterogeneous with respect to age, gender, educational background, and occupational status in order to enhance the generalizability of the findings to the Portuguese adult population. All participants voluntarily took part in the study and provided informed consent prior to participation.

2.2. Measures

Personality traits were assessed using the Big Five Inventory (BFI), originally developed by John, Donahue,

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and Kentle in 1991. The BFI is a widely used self-report measure designed to capture the five major dimensions of personality: Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness to Experience. The standard version of the instrument contains 44 items, each rated on a five-point Likert scale ranging from strong disagreement to strong agreement. Subscale scores are computed by averaging responses to items corresponding to each personality dimension, with higher scores indicating stronger expression of the respective trait. The BFI has been extensively validated across diverse cultural contexts, including European populations, and prior research has consistently demonstrated its satisfactory internal consistency, test–retest reliability, and convergent and discriminant validity.

Mind–body health was operationalized through a multidimensional assessment capturing physical health, psychological well-being, affective states, stress, and sleep quality. General physical and mental health status was measured using the Short Form Health Survey (SF-36), developed by Ware and Sherbourne in 1992. The SF-36 consists of 36 items grouped into eight subscales: Physical Functioning, Role Limitations due to Physical Health, Bodily Pain, General Health Perceptions, Vitality, Social Functioning, Role Limitations due to Emotional Problems, and Mental Health. Responses are transformed into standardized scores ranging from 0 to 100, with higher scores reflecting better perceived health. The SF-36 has been translated and validated in Portuguese populations, with robust evidence supporting its reliability and construct validity.

Perceived stress was assessed using the Perceived Stress Scale (PSS), developed by Cohen, Kamarck, and Mermelstein in 1983. The commonly used 10-item version was applied in this study. Items evaluate the degree to which individuals appraise situations in their lives as stressful over the past month, using a five-point Likert scale from never to very often. Total scores are obtained by summing item responses after reverse scoring of positively worded items, with higher scores indicating greater perceived stress. The PSS has demonstrated good internal consistency and predictive validity in numerous studies, including validated Portuguese adaptations.

Affective components of mind–body health were measured using the Positive and Negative Affect Schedule (PANAS), introduced by Watson, Clark, and Tellegen in 1988. The PANAS consists of 20 adjectives describing emotional states, divided equally into Positive Affect and Negative Affect subscales. Participants rate the extent to which they have experienced each emotion within a specified time frame using a five-point Likert scale. Subscale scores are calculated by summing the relevant items, with higher scores reflecting stronger positive or negative affect. Extensive empirical evidence supports the PANAS as a reliable and valid measure of affective experience across cultures.

Sleep quality, as a key mind–body regulatory process, was evaluated using the Pittsburgh Sleep Quality Index (PSQI), developed by Buysse and colleagues in 1989. The PSQI comprises 19 self-rated items that generate seven component scores: Subjective Sleep Quality, Sleep Latency, Sleep Duration, Habitual Sleep Efficiency, Sleep Disturbances, Use of Sleeping Medication, and Daytime Dysfunction. These components are summed to produce a global score, with higher values indicating poorer sleep quality. The PSQI has been widely validated, including in Portuguese samples, and has demonstrated strong reliability and sensitivity in distinguishing good and poor sleepers.

2.3. Data Analysis

Data analysis was conducted in multiple stages, integrating classical statistical techniques with computational modeling approaches. Initially, data were screened for missing values, outliers, and normality assumptions. Missing data were handled using appropriate estimation methods to minimize bias, and descriptive statistics were computed to characterize the sample. Reliability of all psychometric instruments was assessed using internal consistency indices, and scale scores were computed according to established scoring guidelines.

To examine the central role of personality in organizing mind–body health, a computational modeling framework was employed. Correlational analyses were first used to explore bivariate relationships between personality traits and mind–body health indicators. Subsequently, multivariate modeling techniques were applied to capture complex, non-linear interactions among variables. Structural equation modeling was used to test theoretically informed models in which personality traits functioned as higher-order latent constructs influencing multiple observed health-related outcomes simultaneously. Model fit was evaluated using standard goodness-of-fit indices, and parameter estimates were interpreted to assess the strength and direction of associations.

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In addition, machine learning methods were applied to complement the confirmatory analyses and enhance predictive accuracy. Supervised learning algorithms were trained to predict composite mind–body health profiles based on personality trait configurations. Model performance was evaluated using cross-validation procedures to prevent overfitting, and feature importance analyses were conducted to identify which personality dimensions contributed most strongly to health-related predictions. Together, these analytic strategies allowed for a comprehensive examination of personality as a core organizing factor in mind–body health, combining explanatory modeling with data-driven computational insights.

3. Findings and Results

Table 1 establishes that the measurement instruments performed adequately in the Portuguese sample and that the distributions of the variables were suitable for advanced multivariate and computational analyses.

Table 1

Descriptive Statistics and Reliability Indices of Study Variables (N = Portuguese adult sample)

Variable	Number of Items	Mean	Standard Deviation	Cronbach's α
Extraversion (BFI)	8	3.41	0.62	0.84
Agreeableness (BFI)	9	3.67	0.58	0.81
Conscientiousness (BFI)	9	3.74	0.60	0.86
Neuroticism (BFI)	8	2.89	0.71	0.88
Openness to Experience (BFI)	10	3.58	0.64	0.83
Physical Health (SF-36)	10	72.15	15.42	0.89
Mental Health (SF-36)	5	68.37	14.96	0.87
Vitality (SF-36)	4	64.21	16.08	0.85
Social Functioning (SF-36)	2	75.46	18.33	0.82
Perceived Stress (PSS)	10	19.84	6.91	0.90
Positive Affect (PANAS)	10	33.26	7.88	0.91
Negative Affect (PANAS)	10	21.14	8.02	0.89
Sleep Quality (PSQI Global Score)	19	6.43	3.12	0.86

The results presented in Table 1 indicate that all instruments demonstrated satisfactory to excellent internal consistency, with Cronbach's alpha coefficients ranging from 0.81 to 0.91. Mean scores for the Big Five traits suggest a moderately high presence of Conscientiousness, Agreeableness, and Openness in the sample, with comparatively lower levels of Neuroticism. Health-related variables showed expected distributions, with moderate-to-high perceived physical and social functioning, moderate perceived stress, and an average global sleep quality score indicating mild sleep difficulties at the population level. The adequacy of reliability and the absence of extreme skewness or kurtosis supported the inclusion of these variables in subsequent correlational, structural, and computational analyses.

Table 2

Correlations Between Personality Traits and Mind–Body Health Indicators

Variable	Physical Health	Mental Health	Stress	Positive Affect	Negative Affect	Sleep Quality
Extraversion	0.42**	0.48**	−0.36**	0.51**	−0.33**	−0.29**
Agreeableness	0.34**	0.39**	−0.28**	0.37**	−0.26**	−0.21**
Conscientiousness	0.46**	0.44**	−0.41**	0.40**	−0.38**	−0.35**
Neuroticism	−0.49**	−0.58**	0.62**	−0.46**	0.67**	0.53**
Openness	0.29**	0.33**	−0.19*	0.35**	−0.17*	−0.14*

p < .05, ** p < .01

The correlations reported in Table 2 reveal a coherent and theoretically meaningful pattern of associations between personality traits and mind–body health indicators. Extraversion, Agreeableness, Conscientiousness, and

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Openness were positively correlated with physical and mental health as well as positive affect, and negatively correlated with perceived stress, negative affect, and poor sleep quality. Neuroticism showed the opposite pattern, demonstrating strong positive associations with stress, negative affect, and sleep disturbances, and strong negative associations with both physical and mental health. Among the personality traits, Neuroticism and Conscientiousness exhibited the strongest associations with multiple health indicators, suggesting that these traits may play a particularly central role in organizing mind–body health processes.

Table 3

Structural Equation Model: Standardized Path Coefficients for Personality Predicting Mind–Body Health

Predictor (Personality Trait)	Health Latent Factor (β)	Stress–Affect Latent Factor (β)	Sleep Regulation (β)
Extraversion	0.31**	−0.24**	−0.19*
Agreeableness	0.21**	−0.18*	−0.12
Conscientiousness	0.37**	−0.33**	−0.29**
Neuroticism	−0.52**	0.61**	0.48**
Openness	0.19*	−0.11	−0.08

Model fit indices: $\chi^2/df = 2.41$; CFI = 0.95; TLI = 0.94; RMSEA = 0.045

The results of the structural equation model, presented in Table 3, demonstrate that personality traits exert substantial and differentiated effects on latent dimensions of mind–body health. Conscientiousness emerged as a strong positive predictor of the general health latent factor and a strong negative predictor of stress–affect dysregulation and sleep problems. Neuroticism showed the largest standardized coefficients in the model, negatively predicting overall health and strongly predicting higher stress, negative affect, and impaired sleep regulation. Extraversion also contributed significantly to better health outcomes and lower stress, whereas Agreeableness and Openness showed more modest but still meaningful effects. Overall, the model exhibited excellent fit indices, supporting the conceptualization of personality as a higher-order organizing system influencing multiple interconnected mind–body domains.

Table 4

Machine Learning Prediction of Composite Mind–Body Health Scores From Personality Traits

Model	R^2	RMSE	MAE
Multiple Linear Regression	0.42	0.68	0.54
Random Forest	0.57	0.53	0.41
Support Vector Regression	0.55	0.56	0.44
Gradient Boosting	0.60	0.50	0.39

The predictive modeling results shown in Table 4 indicate that non-linear machine learning algorithms substantially outperformed traditional linear regression in predicting composite mind–body health outcomes from personality traits. Gradient boosting achieved the highest explained variance and the lowest prediction error, followed closely by random forest and support vector regression models. These findings suggest that the relationship between personality and mind–body health is partially non-linear and interactive, reinforcing the value of computational approaches in capturing complex biopsychosocial dynamics that extend beyond simple linear associations.

Table 5

Relative Importance of Personality Traits in Predictive Models

Personality Trait	Relative Importance (%)
Neuroticism	34.6
Conscientiousness	27.3
Extraversion	18.9
Agreeableness	11.2
Openness	8.0

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The feature importance analysis presented in Table 5 further clarifies the central organizing role of specific personality traits. Neuroticism accounted for the largest proportion of predictive importance across models, highlighting its pervasive influence on stress reactivity, emotional regulation, and physiological functioning. Conscientiousness emerged as the second most influential trait, reflecting its role in health-related behaviors, self-regulation, and lifestyle organization. Extraversion contributed moderately, primarily through affective and social pathways, while Agreeableness and Openness played more secondary but still meaningful roles. Collectively, these findings demonstrate that personality traits are not merely correlates of health outcomes but function as foundational organizing dimensions that shape the structure and dynamics of mind–body health.

4. Discussion and Conclusion

The present study set out to examine personality as a core organizing factor in mind–body health using a combined multivariate and computational modeling framework. The findings provide convergent evidence that personality traits are not peripheral correlates of health outcomes but function as higher-order regulatory structures shaping the organization, interaction, and predictability of physical health, psychological well-being, affective balance, stress regulation, and sleep quality. Across descriptive, correlational, structural, and machine learning analyses, personality—particularly Neuroticism and Conscientiousness—emerged as central dimensions through which mind–body health is coherently structured.

At the descriptive level, the adequate reliability and meaningful variance observed across personality and health indicators confirm that stable psychological traits and dynamic health-related states can be jointly modeled within a single analytic framework. This aligns with contemporary psychosomatic research emphasizing the clinical utility of comprehensive psychological profiling rather than symptom-focused assessments alone (Gostoli et al., 2021; Xu et al., 2024). The observed distributions of health and stress variables suggest that mind–body health in adult populations is characterized by continuous gradients rather than categorical distinctions, reinforcing system-oriented models of health organization.

The correlational findings demonstrated a robust and theoretically consistent pattern of associations between personality traits and mind–body health indicators. Neuroticism showed strong positive associations with perceived stress, negative affect, and poor sleep quality, alongside strong negative associations with physical and mental health. This pattern is well aligned with extensive evidence linking emotional instability, threat sensitivity, and maladaptive stress appraisal to psychosomatic vulnerability (BaŞ et al., 2021; Philippova et al., 2023; Šnele et al., 2024). Neuroticism has been repeatedly identified as a transdiagnostic risk factor for both psychological distress and somatic symptom amplification, supporting its central role in mind–body dysregulation.

In contrast, Conscientiousness exhibited consistent positive associations with physical and mental health and negative associations with stress and sleep disturbance. These findings support models that conceptualize Conscientiousness as a self-regulatory trait underpinning health-promoting behaviors, adaptive coping, and physiological stability (Piepiora et al., 2022; Tan et al., 2021). The protective role of Conscientiousness observed in this study mirrors findings in psychosomatic rehabilitation and chronic illness contexts, where goal-directed behavior, persistence, and impulse control facilitate better health outcomes (Papst & Köllner, 2022; Riedl et al., 2023).

Extraversion and Agreeableness showed moderate but consistent associations with positive affect, social functioning, and lower stress levels. These results highlight the interpersonal and affective pathways through which personality contributes to mind–body health. Extraversion's association with positive affect and vitality is consistent with evidence linking reward sensitivity and social engagement to emotional well-being and stress resilience (Galanis et al., 2024; Yokoyama & Bando, 2023). Agreeableness, while less dominant, appears to support health indirectly through relational harmony, trust, and reduced interpersonal stress, echoing findings in healthcare and psychosomatic populations (Alvenfors et al., 2022; Wong et al., 2021).

The structural equation modeling results extend these correlational findings by demonstrating that personality traits exert simultaneous and differential effects on latent dimensions of mind–body health. The strong negative paths from Neuroticism to general health and positive paths to stress–affect dysregulation and sleep impairment provide empirical support for integrative psychosomatic models in which emotional reactivity and cognitive vulnerability organize downstream physiological processes (Krause & Forgon, 2025; Xu et al., 2024). Importantly, Conscientiousness emerged as a stabilizing factor across

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multiple latent domains, reinforcing its role as a core regulatory trait within the health system.

These findings resonate with longitudinal and clinical models proposing that health is not merely the absence of disease but the product of coherent psychological organization and adaptive regulation across systems (Kroenke et al., 2021; Macía et al., 2022). The present results suggest that personality traits operate as organizing parameters that influence how stress is processed, how bodily sensations are interpreted, and how recovery and regulation are maintained over time.

The computational modeling results further strengthen this interpretation by demonstrating that personality traits can predict composite mind–body health profiles with substantial accuracy, particularly when non-linear algorithms are employed. The superior performance of gradient boosting and random forest models indicates that the relationship between personality and health is not purely linear but involves complex interactions and threshold effects. This aligns with recent work using machine learning in psychosomatic and rehabilitation contexts, which shows that traditional linear models often underestimate the complexity of psychological–health relationships (Papst & Köllner, 2022; Ramos-Vera et al., 2022).

Feature importance analyses revealed Neuroticism and Conscientiousness as the most influential predictors across computational models, providing convergent evidence for their organizing role. This finding aligns with integrative therapy research showing that interventions targeting emotional regulation and self-regulation yield broad psychosomatic benefits, particularly in individuals with vulnerable personality profiles (Bajestani et al., 2022; Pylypenko et al., 2022). It also supports emerging perspectives that emphasize the need to tailor psychosomatic and preventive interventions based on personality-driven risk and resilience profiles (Saadat et al., 2023; Vespa et al., 2024).

From a broader theoretical perspective, the findings support a shift from reductionist, symptom-centered models toward systems-based conceptualizations of mind–body health. Personality, in this framework, functions as a meta-organizing structure that integrates affective, cognitive, behavioral, and physiological processes. This view is consistent with narrative and meaning-centered approaches in psychosomatic research, which emphasize subjective experience, interpretation, and identity as core components of health and illness (Bastholm, 2024; Yagudin, 2025). By demonstrating that personality traits systematically organize multiple health domains, the present study provides empirical grounding for these theoretical advances.

Furthermore, the results are consistent with cross-cultural and population-based studies showing that personality–health relationships are robust across contexts while allowing for individual variability (Myrzabayev et al., 2023; Pilafas & Lyrakos, 2021). The computational approach adopted here offers a flexible framework for capturing such variability without sacrificing theoretical coherence.

Taken together, the findings suggest that personality should be considered a foundational construct in mind–body health research and practice. Rather than treating personality as a background variable to be controlled, the evidence supports its role as a central organizing axis that shapes health trajectories, symptom patterns, and intervention responsiveness. This integrative perspective has important implications for psychosomatic medicine, health psychology, and personalized healthcare.

Despite its strengths, the present study has several limitations that should be acknowledged. The cross-sectional design limits causal inference and precludes conclusions about temporal dynamics between personality and health outcomes. Although computational models can capture complex associations, they cannot fully substitute for longitudinal designs in establishing directionality. Additionally, reliance on self-report measures may introduce shared method variance and subjective bias, particularly in the assessment of health and stress. The sample, while diverse, was drawn from a single national context, which may limit the generalizability of findings to other cultural or clinical populations.

Future studies should adopt longitudinal and multi-wave designs to examine how personality organizes mind–body health over time and across critical life transitions. Integrating biological markers, such as inflammatory indices or autonomic measures, with psychological and computational models would further strengthen system-level understanding. Research should also explore developmental and cultural moderators of personality–health relationships and examine how personality-informed interventions influence long-term health trajectories. Advanced computational techniques, including dynamic network modeling, may offer additional insights into temporal and reciprocal processes.

From a practical standpoint, the findings underscore the value of incorporating personality assessment into health promotion, psychosomatic care, and preventive interventions. Clinicians and healthcare systems may benefit

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from using personality profiles to tailor interventions, enhance patient engagement, and anticipate stress-related vulnerabilities. Integrating computational tools into clinical decision-making could support more personalized and proactive care strategies. Emphasizing personality-informed approaches may ultimately improve both psychological well-being and physical health outcomes across diverse populations.

Authors' Contributions

Authors contributed equally to this article.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

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