




## RESONA HEALTH VAGUVIBE REPORT

v.1 JUL 17 2025



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## 1. TITLE

Acute Effects of a Single 1-Hour Session Using the RESONA HEALTH VaguVibe Device on Autonomic Function and Subjective Well-Being

## 2. AUTHORS

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## 3. OBJECTIVE

The primary objective of this study was to evaluate the acute physiological and psychological effects of a single 1-hour session using the RESONA HEALTH VaguVibe device in a population of healthy midlife adults. Specifically, the study aimed to:

- Assess changes in autonomic nervous system (ANS) function, as measured by validated heart rate variability (HRV) parameters—including heart rate (HR), standard deviation of NN intervals (SDNN), and root mean square of successive differences (RMSSD) - using the PPG Stress Flow system (Biotekna, Macron, Italy).
- Quantify self-reported changes in subjective wellness across ten domains related to emotional, cognitive, and physical well-being, using a structured online questionnaire administered immediately before and after the intervention.

The study sought to determine whether PEMF stimulation through the VaguVibe device, which targets vagus nerve modulation, could elicit measurable improvements in autonomic regulation and perceived wellness after a single exposure, thus supporting its potential application as a rapid-acting, non-invasive neuromodulatory tool for wellness optimization.

## 4. METHODS

Thirty-three healthy adult participants (17 men, 16 women; age range: 30–52 years) were enrolled in this pre-post observational study designed to assess the acute effects of a single 1-hour session using the RESONA HEALTH VaguVibe device. The session involved participants sitting comfortably while receiving non-invasive PEMF stimulation delivered through the Resone Health VaguVibe device, designed to support autonomic balance and promote relaxation via PEMF neuromodulation.

### 4.1. PHYSIOLOGICAL DATA COLLECTION

Autonomic function was assessed immediately before and after the session using the PPG Stress Flow system by BioTekna, a validated photoplethysmographic technology that measures heart rate (HR), the standard deviation of NN intervals (SDNN), and the root mean square of successive differences (RMSSD). SDNN provides a global index of heart rate variability (HRV) and overall autonomic adaptability, while RMSSD is a sensitive marker of parasympathetic (vagal) activity and emotional resilience.

### 4.2. SUBJECTIVE ASSESSMENTS

Self-reported wellness was measured using a 10-item online questionnaire covering: (1) emotional state, (2) anxiety, (3) stress, (4) relaxation, (5) mental clarity, (6) fatigue, (7) energy levels, (8) aches and pains, (9) physical comfort, and (10) overall sense of well-being. Each item was rated by participants using a numerical scale before and after the session, and responses were submitted via a secure HIPAA-compliant online platform.

### 4.3. STATISTICAL ANALYSIS

All data were collected and processed centrally. Outliers were identified and removed using the ROUT method (Q=1%) in GraphPad Prism v10.0 (La Jolla, CA, USA). Data distribution was assessed using a battery of normality tests, including the Anderson-Darling, D'Agostino & Pearson, Shapiro-Wilk, and Kolmogorov-Smirnov tests. Depending on normality, comparisons between pre- and post-session values were analyzed using paired t-tests (for parametric data) or matched-pairs Wilcoxon signed-rank tests (for non-parametric data). Data are reported as mean percentage changes, with error bars representing standard deviation (SD). Statistical significance was set at  $p < 0.05$ .

## 5. RESULTS

Analysis of physiological parameters revealed statistically significant improvements in autonomic nervous system function following a single 1-hour session with the VaguVibe device:

- Heart Rate (HR): Mean HR decreased by 3.8%, suggesting a shift toward parasympathetic dominance and a relaxation response.
- SDNN (Standard Deviation of NN intervals): Increased by 32%, indicating a substantial enhancement in overall heart rate variability, which reflects improved autonomic flexibility and systemic adaptability.
- RMSSD (Root Mean Square of Successive Differences): Increased by 16%, pointing to increased parasympathetic (vagal) tone, associated with greater emotional regulation and physiological recovery.

Self-reported wellness assessments further supported the physiological findings. Significant improvements ( $p < 0.05$ ) were observed in 9 out of 10 questionnaire items:

- State of Mind (Emotional State): Improved by +7.5%, indicating a more balanced emotional outlook post-intervention.
- Anxiety: Decreased by -20%, suggesting the session had a calming effect and reduced mental tension.
- Stress: Decreased by -20%, reinforcing the role of the session in lowering perceived psychosocial stress.
- Relaxation: Increased by +31%, one of the most pronounced effects, highlighting the immediate calming and restorative potential of the VaguVibe session.
- Mental Clarity: Improved by +7.5%, reflecting enhanced cognitive calm and focus.
- Fatigue: Decreased by -6%; however, this change did not reach statistical significance ( $p > 0.05$ ), indicating variability in participant response.
- Energy Levels: Increased by +11.5%, reflecting an energizing effect post-session, possibly due to improved autonomic regulation.
- Aches and Pains: Reported reduction of -28%, suggesting potential benefits for perceived musculoskeletal or somatic discomfort.
- Physical Comfort: Increased by +9%, supporting an overall improvement in bodily ease and physical well-being.
- Sense of Well-Being: Improved by +10%, affirming a general enhancement in subjective health and wellness perception.

## 6. INTERPRETATION

The findings of this study demonstrate converging objective and subjective improvements, consistent with the proposed mechanism of action of the VaguVibe device—vagal stimulation leading to enhanced autonomic balance. The observed increase in SDNN reflects improved overall heart rate variability and greater autonomic adaptability. At the same time, the rise in RMSSD indicates enhanced parasympathetic (vagal) activity, associated with emotional regulation, physiological recovery, and stress resilience.

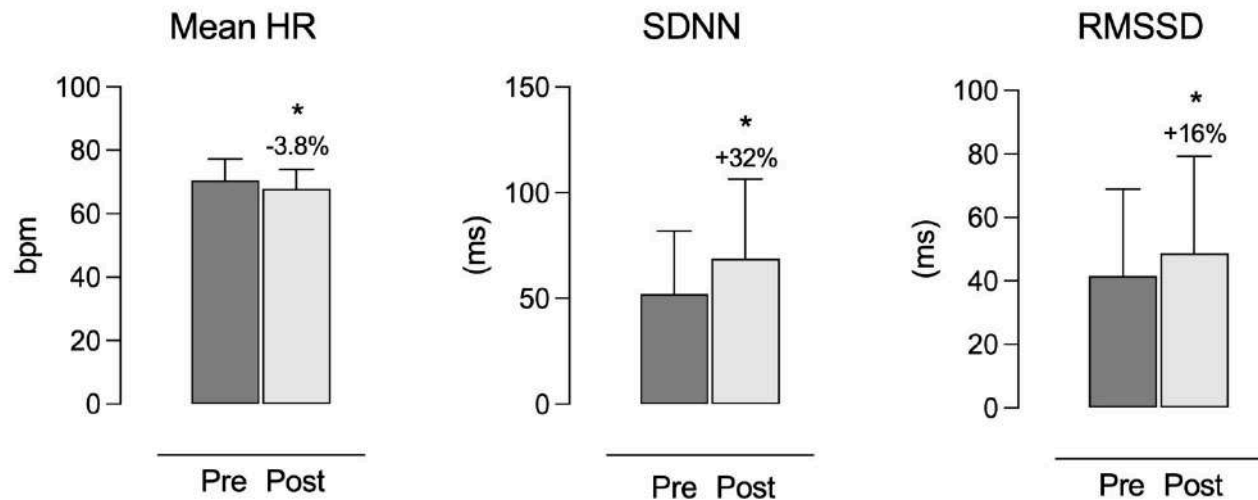
Simultaneous reductions in heart rate, anxiety, stress, and pain, along with increases in relaxation, energy, and overall well-being, suggest a coherent shift toward restorative autonomic regulation. The strong alignment between physiological biomarkers (HRV parameters) and subjective wellness improvements reinforces the clinical and wellness relevance of the intervention. These results support the use of the VaguVibe device as a promising, non-invasive modality for rapid modulation of stress responses and enhancement of both emotional and physical well-being.

## 7. CONCLUSION

A single 1-hour session with the RESONA HEALTH VaguVibe device led to statistically significant improvements in both autonomic nervous system (ANS) function and self-reported measures of emotional and physical well-being in a cohort of midlife adults. The intervention produced measurable increases in HRV parameters (SDNN and RMSSD), indicating enhanced autonomic flexibility and parasympathetic (vagal) tone, alongside meaningful reductions in heart rate, perceived stress, anxiety, and pain.

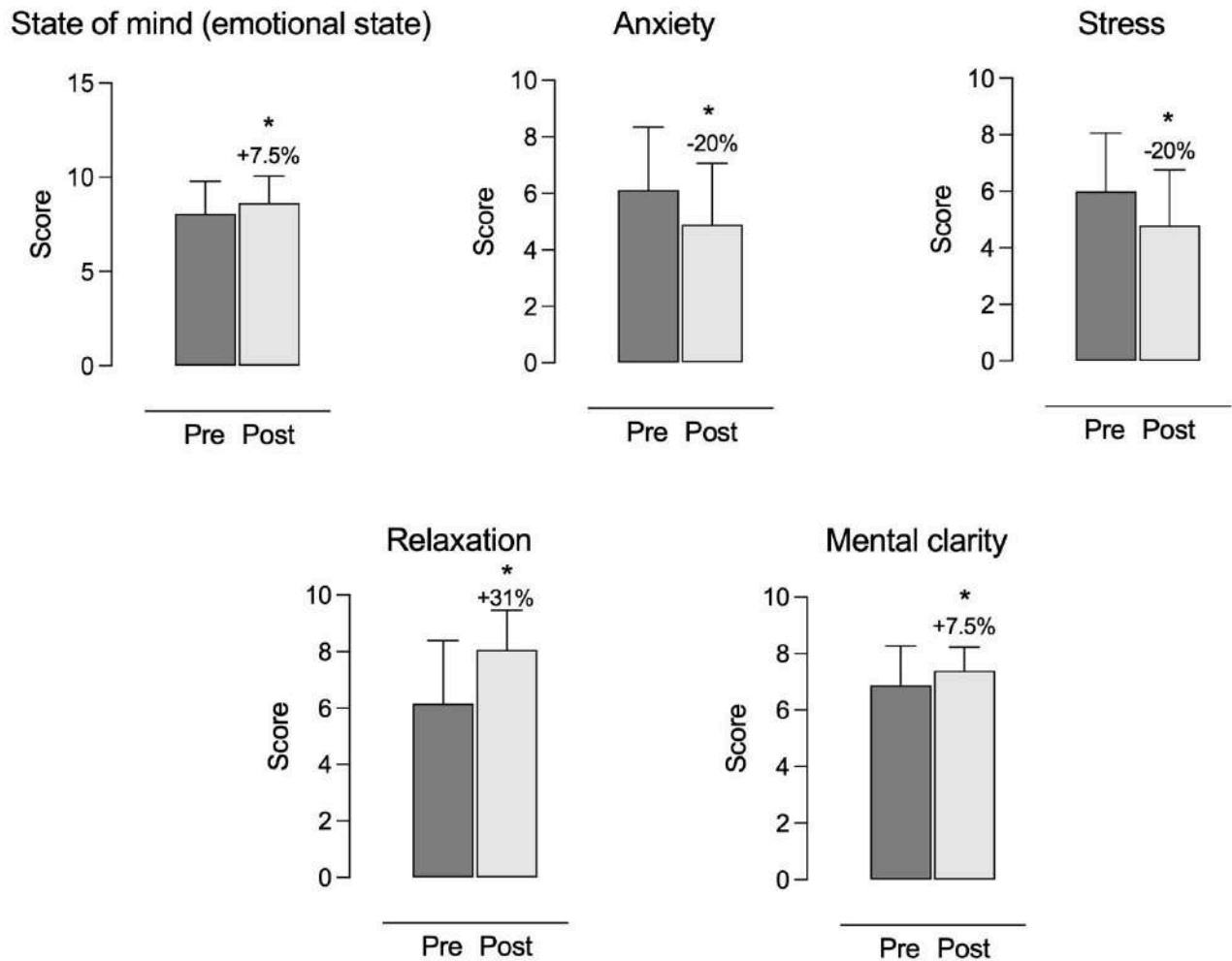
In parallel, participants reported notable improvements in key wellness domains such as relaxation, energy, emotional balance, and overall sense of well-being, reinforcing the physiological findings and highlighting the integrative mind-body effects of the VaguVibe technology.

These outcomes suggest that the VaguVibe device may serve as an effective, non-invasive, and time-efficient neuromodulatory tool for promoting stress recovery, emotional regulation, and physiological resilience. Further research is warranted to explore its cumulative effects, long-term benefits, and potential applications in broader wellness and clinical populations.



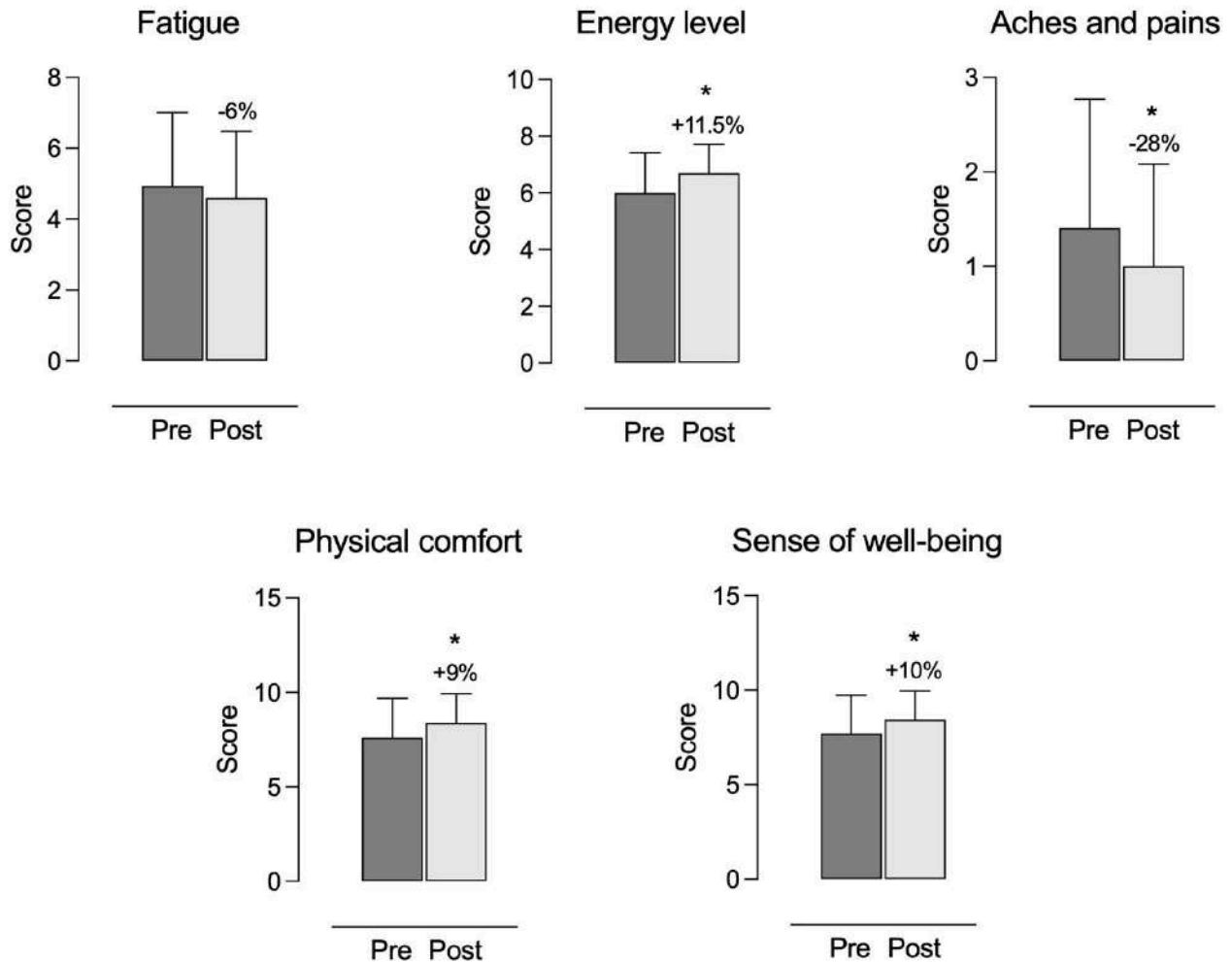
Graph 1: HRV Parameters (HR, SDNN, RMSSD).

This graph illustrates the changes in autonomic nervous system function following a single 1-hour VaguVibe session. Heart rate (HR) decreased by 3.8%, while SDNN and RMSSD increased by 32% and 16%, respectively, indicating enhanced autonomic flexibility and increased parasympathetic (vagal) activity.



Graph 2: Subjective Well-Being – Questions 1–5.

Self-reported outcomes related to emotional and cognitive wellness showed significant improvements post-session: emotional state (+7.5%), anxiety (–20%), stress (–20%), relaxation (+31%), and mental clarity (+7.5%). These findings highlight the device’s impact on emotional regulation and mental balance.



Graph 3: Subjective Well-Being – Questions 6–10.

Participants reported physical and energetic benefits following the session: fatigue (–6%, not significant), energy levels (+11.5%), aches and pains (–28%), physical comfort (+9%), and overall well-being (+10%). These results reflect the perceived mind-body effects of vagal neuromodulation.