Research Summary: Efficacy of Tension & Trauma Releasing Exercises (TRE) on Psychological and Somatic Symptoms

1.0 Study Objective

In the search for effective treatments for psychological and somatic distress, evaluating non-pharmacological, body-based interventions is of strategic importance. These approaches offer potential alternatives or complements to traditional therapies, addressing the complex interplay between mind and body. The primary objective of this research was to rigorously assess the efficacy, immediacy, and durability of a Tension & Trauma Releasing Exercises (TRE) intervention. Specifically, the study aimed to determine if TRE could produce significant improvements in a range of psychological and somatic symptoms when compared to a non-intervention, waiting list control group. To achieve this, the study employed a controlled trial design with longitudinal data collection.

2.0 Methodology

To ensure the validity and reliability of the findings, this study utilized a controlled experimental design. The methodology was structured to compare changes in the intervention group against a control group

over time, using validated assessment tools and appropriate statistical analysis.

2.1 Study Design and Participants

The research was conducted as a controlled trial comparing an experimental group, which received the TRE intervention, against a waiting list control group. The initial sample consisted of 42 participants in the experimental group and 38 in the waiting list group.

A review of baseline demographics confirmed that the two groups were comparable at the outset of the study. The mean age was 37.83 years for the experimental group and 34.32 for the waiting list group. Both groups were predominantly female (88.1% and 84.2%, respectively). Critically, there were no statistically significant differences between the groups in terms of age ($p=0.084$), education ($p=0.140$), or gender distribution ($p=0.614$), establishing a solid foundation for comparing the intervention's effects.

2.2 Assessment and Analysis

A comprehensive battery of validated scales was used to measure outcomes across several key domains:

- Psychological Distress: Kessler Psychological Distress Scale (K10)

- Depression: Beck Depression Inventory-II (BDI-II) and Hamilton Depression Rating Scale (HAMD)
- Anxiety: Beck Anxiety Inventory (BAI) and Hamilton Anxiety Rating Scale (HAMA)
- Somatic Symptoms: Patient Health Questionnaire-15 (PHQ-15) and Somatic Symptom Disorder - B Criteria Scale (SSD-12)
- Health Anxiety: Whitely Index (WI)
- Sleep Quality: Athens Insomnia Scale (AIS)

Data were collected at four distinct time points to track changes: at baseline before the intervention (T1), at 4 weeks mid-intervention (T2), at 8 weeks upon completion of the intervention (T3), and at a 1-month follow-up (T4).

The primary statistical method used to evaluate the intervention's effect was repeated measures analysis of variance (ANOVA), which allowed for the examination of changes over time between the two groups. The following section details the results of this analysis.

3.0 Key Findings

The data analysis reveals that the TRE intervention had a statistically significant and positive impact on most of the measured psychological and somatic symptoms when compared to the waiting list control

group. The improvements varied in their timing and magnitude across different symptom clusters, but the overall trend demonstrates a clear therapeutic benefit.

3.1 Baseline Comparability

Before the intervention, the experimental and waiting list groups showed no significant differences on most measures. This included key indicators such as psychological distress (K10), the severity and distress of somatic symptoms (PHQ-15, SSD-12), and clinician-rated depression (HAMD) and anxiety (HAMA).

It is important to note, however, that the groups were not equivalent on all measures, with statistically significant baseline differences observed in:

- Self-reported depression (BDI-II, $p=0.040$)
- Self-reported anxiety (BAI, $p=0.002$)
- Sleep quality (AIS, $p=0.045$)

While these baseline differences in self-reported measures were noted, the use of repeated measures ANOVA, which analyzes the change over time between groups, mitigates their impact on the final efficacy conclusions.

3.2 Overall Intervention Efficacy

The repeated measures ANOVA revealed a significant "time*group" interaction effect for the majority of outcome variables. This finding is crucial, as it indicates that the pattern of change in symptoms over the four time points was significantly different for the TRE group compared to the control group, directly pointing to the intervention's efficacy.

The intervention demonstrated a broad and significant effect across the following domains:

- Psychological Distress (K10): $F=4.414$, $p=0.005$
- Depression (BDI-II & HAMD): $F=11.680$, $p<0.001$ and $F=7.173$, $p=0.002$, respectively.
- Somatic Symptoms (PHQ-15 & SSD-12): $F=9.473$, $p<0.001$ and $F=10.109$, $p<0.001$, respectively.
- Clinician-Rated Anxiety (HAMA): $F=7.344$, $p=0.001$
- Health Anxiety (WI): $F=6.942$, $p=0.001$
- Sleep Quality (AIS): $F=5.642$, $p=0.003$

Notably, the interaction effect for self-reported anxiety (BAI) was not statistically significant ($p=0.133$). This discrepancy suggests that while participants' internal, subjective feeling of anxiety did not change significantly relative to the control group, their observable, clinician-

rated symptoms (e.g., restlessness, tension) as measured by the HAMA did show a specific and significant response to the TRE intervention.

3.3 Onset and Durability of Symptom Improvement

Post-hoc analysis within the TRE group provided valuable insights into the timing and persistence of the therapeutic effects. The results show a differential pattern of improvement, with some symptoms responding rapidly and progressively, others improving more gradually, and some showing a unique trajectory.

Immediate and Progressive Improvements

Significant reductions from baseline (T1) were observed as early as the 4-week mark (T2) for psychological distress and self-reported depression, with these gains maintained through follow-up. For clinician-rated depression (HAMD) and anxiety (HAMA), not only were initial gains observed by week 4, but there was evidence of progressive improvement throughout the study period. This is demonstrated by significant further reductions between the 4-week mark and the 1-month follow-up (T2 vs T4; HAMD: $p=0.001$; HAMA: $p=0.004$), indicating the therapeutic effect deepened over time.

Delayed or Gradual Improvements

For other symptoms, the therapeutic effect was more gradual. Significant reductions in somatic symptom distress (SSD-12) were achieved by the end of the 8-week intervention (T3 vs T1). For somatic symptom severity (PHQ-15), the improvement was marginally significant at T3 ($p=0.05$) before becoming more robust at the T4 follow-up ($p=0.02$). For self-reported anxiety (BAI) and health anxiety (WI), significant improvements were only evident at the 1-month follow-up (T4 vs T1), suggesting a lagged effect where benefits consolidated after formal sessions concluded.

Unique Improvement Trajectory: Sleep Quality

Improvement in sleep quality (AIS) followed a distinct pattern. It reached marginal significance by week 4 (T1 vs T2, $p=0.05$) and became more robust by the end of the intervention at week 8 (T1 vs T3, $p=0.005$). However, this effect was not fully maintained at the one-month follow-up (T1 vs T4, $p=0.053$), indicating a more transient benefit compared to other domains.

In summary, the intervention appears to exert a rapid effect on core affective and distress symptoms, while improvements in somatic complaints and subjective anxiety manifest more gradually, with some benefits consolidating only after the intervention has concluded.

4.0 Conclusion and Implications

The evidence from this controlled trial strongly supports the efficacy of the TRE intervention. Participants who underwent the 8-week program demonstrated significant, durable improvements across a wide range of psychological and somatic symptoms compared to a control group, whose symptoms remained largely unchanged.

Based on the comprehensive analysis, the TRE intervention is an effective treatment for reducing psychological distress, depression, anxiety, and somatic complaints. The key characteristics of its therapeutic effects can be summarized as follows:

- Broad Efficacy: The intervention proved effective across multiple domains, simultaneously reducing psychological distress, both self-reported and clinician-assessed depression, clinician-assessed anxiety, and the severity and distress of somatic symptoms.
- Rapid Onset: For core psychological symptoms, including depression and distress, the benefits were rapid, with significant improvements documented within the first four weeks of the intervention.
- Lasting Results: The therapeutic gains were shown to be durable, persisting at a 1-month follow-up assessment and, in the case of

clinician-rated symptoms, showing evidence of progressive improvement even after the intervention period ended.

These findings have significant practical implications. For clinicians, TRE may represent a valuable, evidence-based, non-pharmacological therapeutic option for patients presenting with a mix of psychological and physical symptoms. For researchers, the data raises critical questions about the mechanisms of action; specifically, why core psychological distress improves rapidly while the cognitive appraisal of anxiety and somatic symptoms follows a more delayed course.