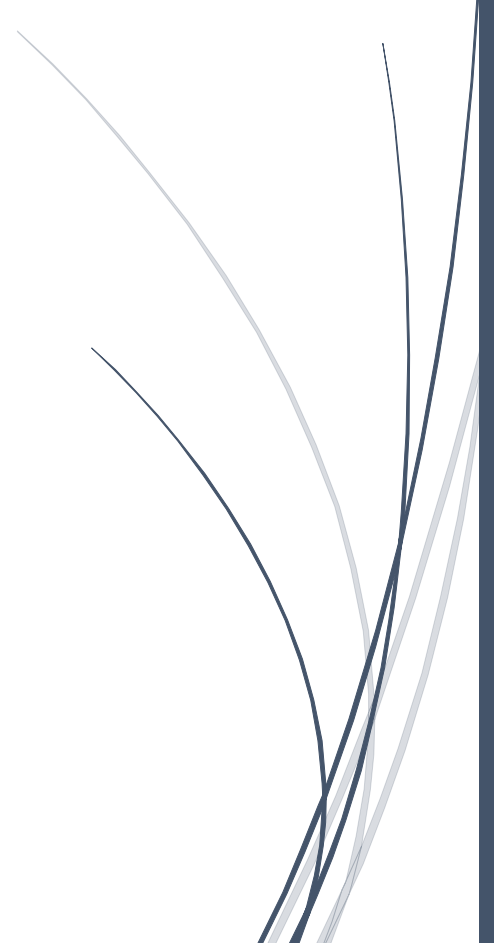


# Midterm Report

27/2/2023

The impact of Transcendental Meditation on symptom severity and wellbeing among patients diagnosed with chronic combat Post-Traumatic Stress Disorder

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## Introduction

Transcendental Meditation (TM) is one of the oldest methods of meditation practice, existing since the 1950s. The meditation is practiced only in thought, while sitting comfortably on a chair or armchair, twice a day, for 10-20 minutes at a time. TM uses a mantra (meaningless sound), which is customized for the practitioner. There is no focus, no engagement in any content or observation of any kind in the practice, whether verbal, physical or environmental. Previous studies conducted among patients with post-traumatic stress disorder (PTSD) found that the practice of TM was associated with a reduction of post-traumatic stress symptom severity, and with an improvement in the quality of life and social functioning (Barnes, Monto, Williams, & Rigg, 2016; Barnes, Rigg, Williams, 2013; Rosenthal, Grosswald, Ross, & Rosenthal, 2011).

The Ministry of Defense's (MOD) Rehabilitation Clinic associated with the Psychiatric Division and the Rambam Health Care Campus provides mental health care to approximately 650 people, 50% of whom suffer from PTSD, mostly due to combat. About 20% of the patients are members of minorities, which include mainly Druze and Bedouin. The clinic consists of a multidisciplinary team of psychiatrists, clinical psychologists and clinical social workers skilled in the treatment of PTSD. The clinic's therapeutic approach is unique and comprehensive, built on insights from the fields of intercultural psychiatry, disease management, and mental health rehabilitation (Caspi, 2016).

The purpose of the current study was to examine the effectiveness of learning and practicing TM while comparing the results to a proven effective treatment of the Eye Movement Desensitization and Reprocessing (EMDR) technique, among the clinic's patients, diagnosed with PTSD due to their military service. However, due to the patients' difficulties in receiving EMDR therapy, which led to a high dropout rate from the study, we amended the study's design and removed the EMDR therapy from the protocol. Thus, according to the revised protocol (v.2.3., March 31, 2022), the study's design and objectives are prospective, single arm, open label assessing the effectiveness of practicing TM on mental health and quality of life of patients diagnosed with PTSD due to their military service. The effectiveness of the intervention is

examined using validated assessment tools, assessing the severity of post-traumatic symptoms, sleep quality, quality of life, self-efficacy, and daily functioning at three different time points, detailed in the method chapter.

The findings presented in the report below show the alterations that occurred in the 66 patients who have been recruited to the study so far and took part in the meditation arm.

## Method

### Participants

In the current midterm report, 66 participants underwent a baseline interview ( $T_0$ ), whereas 23 (34.8%) completed 3-monthes follow-up after ( $T_1$ ), and 12 (18.2%) completed the final 6-monthes follow-up ( $T_2$ ).

All participant were man, diagnosed with PTSD due to their military service, aged 25-80 ( $M = 50.48$ ,  $SD = 12.68$ ), who were released from the army between 5-61 years ( $M = 26$ ,  $SD = 13.8$ ). Twenty-five participants (37.8%) dropped-out of the study after baseline evaluation (the majority withdrew after the introductory lecture and prior the TM course).

No significant differences were found in the socio-demographic characteristics between patients who were dropouts and patients who completed at least one follow-up assessment. In addition, no significant differences were found in the levels of severity of symptoms, quality of sleep, quality of life, level of self-efficacy at the time of entering the study, between dropouts and those who completed at least one follow-up assessment.

Table 1 below shows the background characteristics of the complete sample.

**Table 1.***Background characteristics of the study population (N=66).*

<b>Variables</b>	<b>Categories</b>	<b>n</b>	<b>%</b>
Country Origin	Other	13	19.7
	Israel	53	80.3
Country Origin-Mother	Other	40	60.6
	Israel	26	39.4
Country Origin-Father	Other	40	60.6
	Israel	26	39.4
Native language	Hebrew	42	63.6
	Arabic	18	27.3
	Other	6	9.1
Education	High school (vocational/partial matriculation)	17	25.8
	High school education (full matriculation)	16	24.2
	Vocational studies	6	9.1
	Academic education	27	40.9
Marital	Married	41	62.1
	Other	25	37.9
Children	Yes	54	81.8
	No	12	18.2
Lives with	Spouse	12	18.2
	Spouse and children	38	57.6
	Parents	8	12.1
	Alone	8	12.1
Religion	Jewish	41	62.1
	Other	25	37.9
Religiousness	Secular	42	63.6
	Traditional	12	18.2

<b>Variables</b>	<b>Categories</b>	<b>n</b>	<b>%</b>
	Religious	6	9.1
	Missing	6	9.1
Economic situation	Above average	24	36.4
	Average	30	45.5
	Below average	12	18.2
Military service	Full service	62	93.9
	Partial-up to one year	1	1.5
	Partial-up to two years	2	3
	Other	1	1.5
Combat service	No	6	9.1
	Yes	60	90.9
Work in the past year	No	35	53
	Yes	31	47
Study in the past year	No	59	89.4
	Yes	7	10.6
Support (club or Havat rum)	No	45	68.2
	Yes	21	31.8
Health condition	Excellent	3	4.5
	Very good	5	7.6
	Good	13	19.7
	Fine	18	27.3
	Bad	27	40.9
Psychotherapy	No	25	37.9
	Yes	35	53
	Missing	6	9.1
Other mental illnesses	No	42	63.6
	Missing	18	27.3

## Study measurements

The research measurements include a battery of questionnaires and clinical assessments, as detailed below:

1. Demographic characteristics were measured using a Demographic Questionnaire built for the purpose of the current study, which includes the standard items such as date of birth, education, marital status, religion and more. In addition, the questionnaire includes details on the status in the Ministry of Health and the percentage of disability, hospitalizations, etc.
2. Exposure to stressful events was measured using a life events questionnaire that includes exposure to 10 different stressful events, such as being involved in a car accident, witnessing a traumatic event, childhood sexual abuse, and more. The questionnaire is delivered to the patients at the three time points, where at  $T_0$  the patient is asked to answer the statements in the context of all the years of his life and at  $T_1$  and  $T_2$  for the last three months only.
3. Post-traumatic stress symptoms were assessed using the Clinical-Administered PTSD Scale for DSM-5 (CAPS-5; Weathers et al., 2013). The CAPS-5 includes 20 items that match the updated PTSD definition in DSM5. In addition to symptom evaluation, the questions are aimed at examining the onset (onset and duration of symptoms, assessing the accompanying distress, the effect of symptoms on social and occupational functioning, improvement in symptoms from previous questionnaire transmission, reliability of reporting, overall severity of disruption and treatment of the disorder.
4. Sleep disturbances were assessed using the Pittsburgh Sleep Quality Index (PSQI; Buysse et al., 1989). The PSQI includes 19 items that make up seven components of the Global Score. The questionnaire was used for research and clinical needs within a wide range of populations and has been translated into many languages.
5. Substance use was assessed using the Addictive Substance Use Questionnaire, which examines the extent to which alcohol, cigarettes, marijuana, and other drugs have been used during the past month.

6. Self-efficacy was assessed using the General Self-Efficacy Scale Questionnaire (Chen et al., 2001). The questionnaire examines the individual's perception of his or her belief in his or her ability to achieve goals in any situation and overcome obstacles in daily life. The questionnaire consists of 14 items that are marked across a five-point Likert scale, from "*not at all*" (1) to "*very much*" (5), which answers the question "to what extent what is said about you is true." The questionnaire has been tested in various studies and has been found to have high content validity and high predictive power.
7. Quality of life was assessed using the Subjective Quality of Life Assessment developed by the World Health Organization – WHOQOL BREF (WHOQOL Group, 1995). The questionnaire assesses the subjects' perceptions of their quality of life and is intended for both the healthy population and the population in distress, illness or serious condition (De Vries , 1999). This is an abbreviated version of the WHOQOL-100 questionnaire, which is a self-report consisting of 26 items on a Likert scale from 1-5 "*not at all*" to "*very much*" and it evaluates four areas of life related to quality of life: physical health, Psychological health, social connections and environment. It also provides a general assessment of the patient's quality of life and health. The score in each area is calculated according to the average of the total items and multiplied by 4 for comparison with the area scores in WHOQOL-100. There are a total of 6 scores from the questionnaire, 4 scores according to the categories, a general score in the quality of life assessment and a score in the health assessment, with a high score indicating good health in the category. The questionnaire was translated and validated by Ben Yaakov and Amir (2001).
8. Changes in daily life function were assessed using a self-report questionnaire that was developed for the current study. The questionnaire includes 5 items examining changes in everyday life following the TM practice on a scale between 0 "*not at all*" and 10 "*extremely*".

## Procedure

The research procedure includes the following stages:

1. T<sub>0</sub>: Explanation and Informed Consent, Baseline evaluations (Demographic Questionnaire, CAPS-5, Sleep Questionnaire, Questionnaire on the Use of Addictive Substances, Self-Efficacy questionnaire, and Quality of Life questionnaire).
2. TM introductory lecture, followed by a 4 consecutive days TM course.
3. T<sub>1</sub>: 3-months follow-up (an update on Life Events Questionnaire, Sleep Questionnaire, Questionnaire on the Use of Addictive Substances, Self-Efficacy Questionnaire, Quality of Life questionnaire, and Self-Assessment Questionnaire of change following meditation practice).
4. T<sub>2</sub>: 6-monthes follow-up (CAPS-5, an update on Life Events Questionnaire, Sleep Questionnaire, Questionnaire on the Use of Addictive Substances, Self-Efficacy Questionnaire, Quality of Life questionnaire, and Self-Assessment Questionnaire of change following meditation practice).



# Results

## Descriptive statistics

The following table shows the means of the main research indices, as estimated at the three time points (T<sub>0</sub>- T<sub>2</sub>).

**Table 2.**

*Means and standard deviations of the main research indices.*

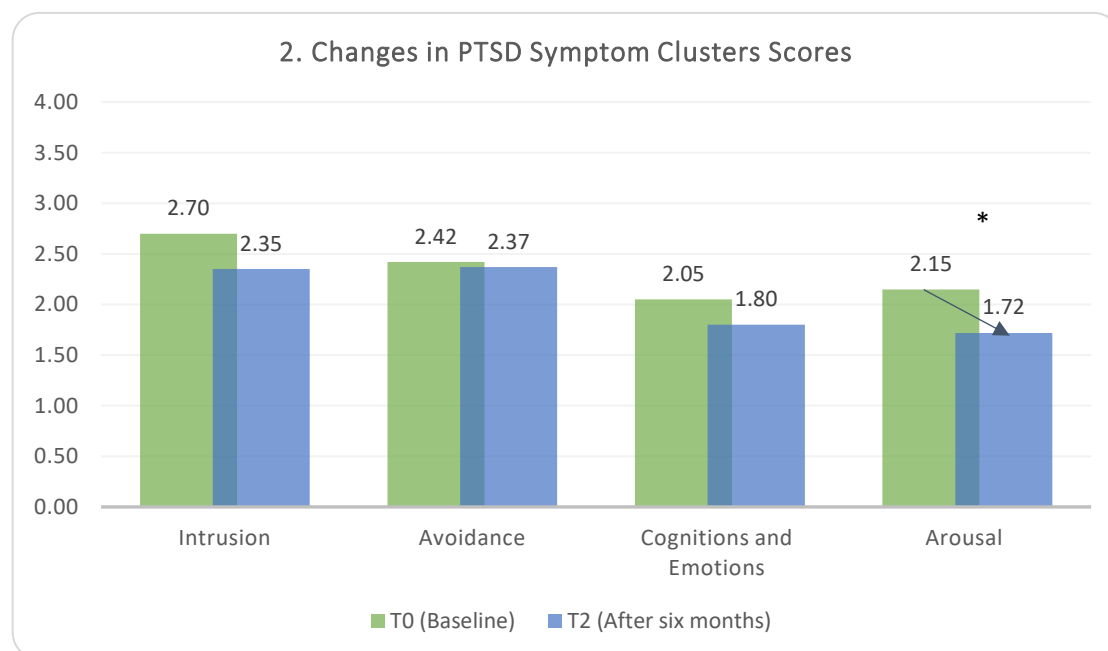
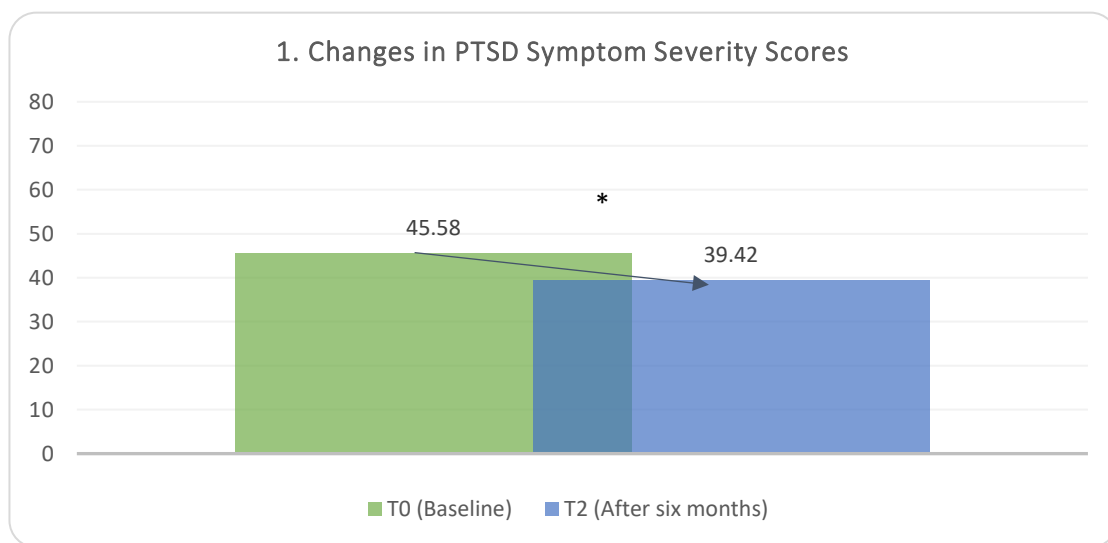
Variables	Categories	T <sub>0</sub>		T <sub>1</sub>		T <sub>2</sub>	
		M	SD	M	SD	M	SD
Stressful life event (0-10)	Count different types of events	4.00	1.51	--	--	--	--
CAPS-5	Total severity score (0-80)	45.83	11.58	--	--	39.42	15.93
	Intrusion (0-4)	2.57	0.73	--	--	2.35	1.13
	Avoidance (0-4)	2.62	0.94	--	--	2.37	1.05
	Cognitions and Emotions (0-4)	2.13	0.78	--	--	1.80	1.05
	Arousal (0-4)	2.13	0.56	--	--	1.72	0.77
Sleeping quality (0-3)	Subjective sleep quality	2.27	0.85	1.91	0.97	1.83	1.19
	Sleep latency	2.27	0.90	1.82	0.79	2.08	1.00
	Sleep duration	2.51	0.80	2.14	0.99	2.27	1.00
	Habitual sleep efficiency	1.81	1.33	1.77	1.27	1.30	1.34
	Sleep Disturbances	2.21	0.67	2.00	0.82	1.67	0.65
	Use of Sleeping medication	2.50	1.07	2.64	0.90	2.33	1.23

	Daytime dysfunction	1.67	1.00	1.18	1.05	1.36	0.92
	Global PSQI Score: (0-21)	15.35	3.73	13.45	3.70	11.89	4.81
General self- efficacy (1-5)		3.20	1.13	3.40	1.09	3.29	1.40
Quality of life (4-20)	General quality life	9.33	3.83	10.35	4.6	11.17	5.75
	Physical quality life	12.13	2.10	12.62	2.72	11.90	2.26
	Psychological quality life	12.66	2.93	13.15	3.53	13.45	3.83
	Social quality life	11.29	2.94	12.58	4.40	12.88	3.40
	Environmental quality life	15.57	3.37	14.96	3.00	14.33	3.60
Change in Daily-life activities (0-10)	Daily activities	--	--	5.39	2.62	4.92	3.29
	Social activities	--	--	3.87	3.24	4.33	3.65
	Sleep quality	--	--	3.56	3.53	4.00	3.44
	Mood and affect	--	--	4.83	2.90	6.08	2.47

## Estimation of treatment effectiveness

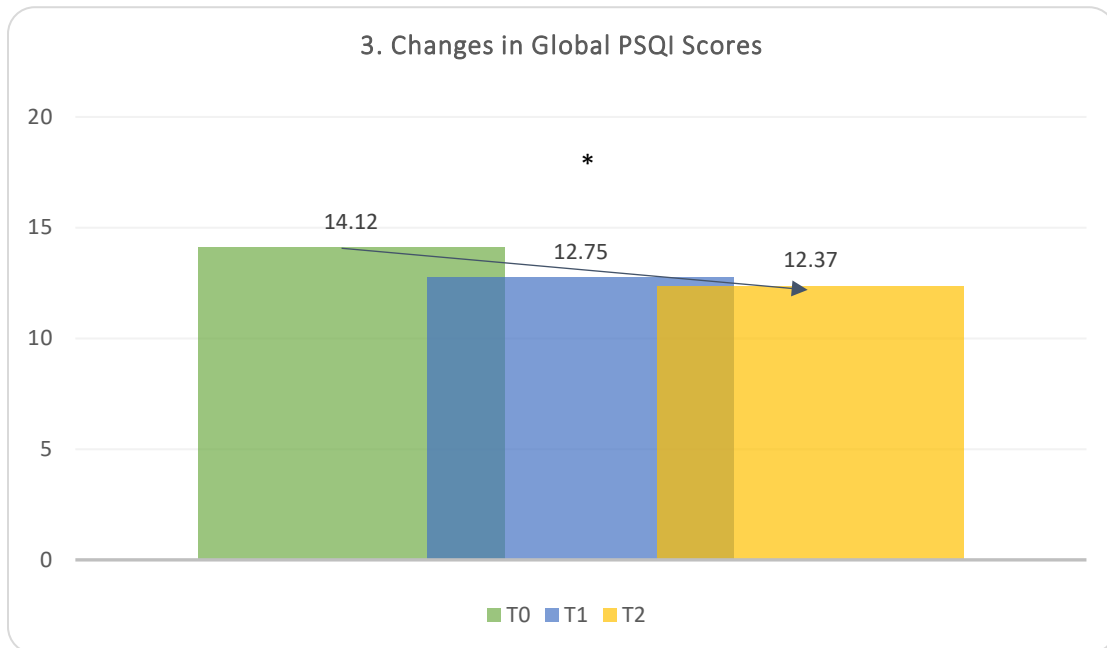
### 1.1. PTSD symptom severity

Paired-sample t-tests results indicated a decrease of 13.4% in overall PTSD symptom severity levels between baseline and six-months follow-up assessments, which was statistically significant ( $t(11) = 2.38, p = .036$ ). In addition, as presented in figure 2, there is a trend of symptom severity reduction for all symptom clusters, which was statistically significant for the arousal clusters ( $t(11) = 3.05, p = .011$ ).



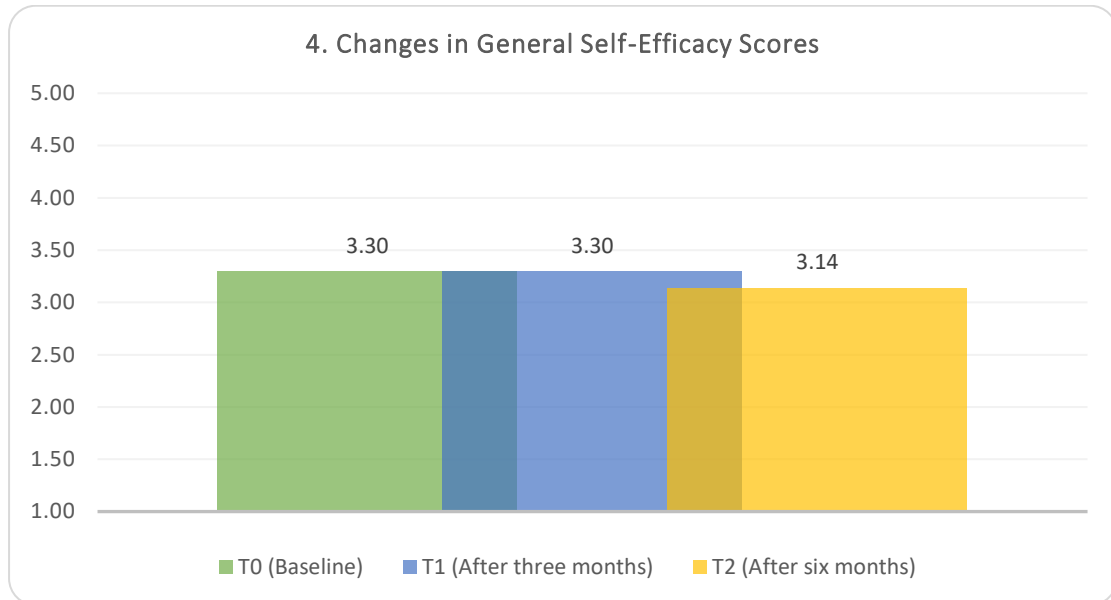
## 1.2. Quality of sleep

Paired-sample t-tests results indicated a decrease of 12.4% in the severity of sleep difficulties levels between baseline and six-months follow-up assessments, which was statistically significant ( $t(8) = 2.28, p = 0.038$ ).



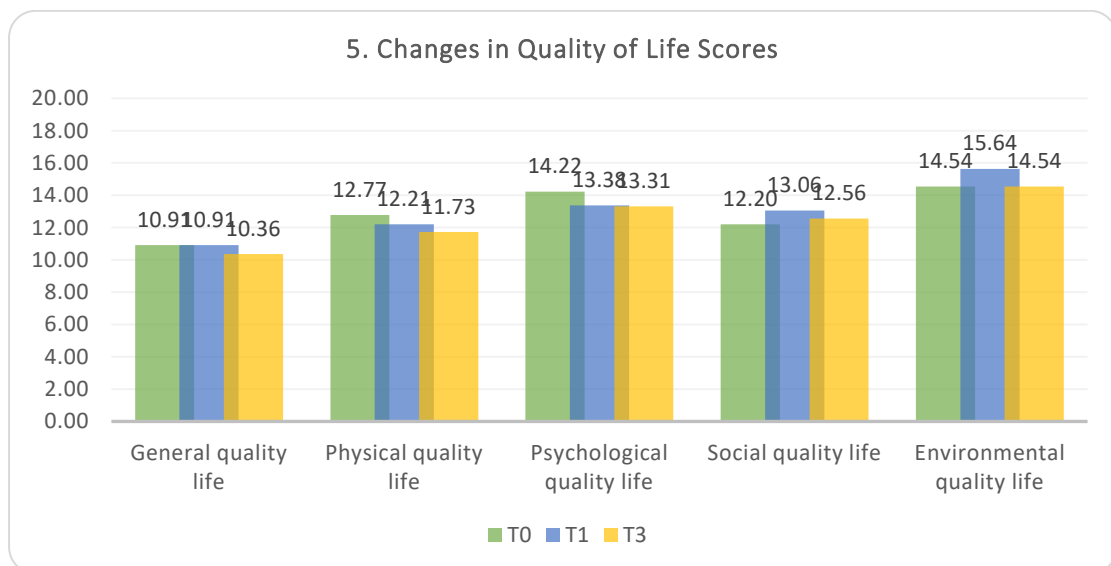
### 1.3. General Self-Efficacy

No significant changes were found in the levels of self-efficacy between the 3-time points, as can be seen in Figure 4 below.



### 1.4. Quality of life

No significant changes were found in the levels of quality of life dimensions between the 3-time points, as can be seen in Figure 5 below.



## Discussion

The current report is based on findings obtained from 66 patients who entered the study, whereas 23 (34.8%) also completed a first 3-monthes, and 12 (18.2%) completed the 6-monthes follow-up questionnaires. Twenty-five participants (37.8%) dropped-out of the study after baseline evaluation

The findings show that patients, who fully practiced Transcendental Meditation (TM) without dropping out, showed a significant decrease in the severity of overall post-traumatic symptoms, and in particular in the arousal symptom cluster. These findings are consistent with previous studies, which found that practicing TM could lead to a significant decrease in the intensity of post-traumatic symptoms (Barnes et al., 2013, 2016; Rosenthal et al., 2011). Furthermore, the results also point to a significant decrease in the severity of sleep difficulties, which are in line with previous studies (Mason et al., 1997; Nagendra, Maruthai & Kutty, 2012); suggesting that practicing TM could improve PTSD symptomatology and the quality of sleep among patients with PTSD-related military service.

Surprisingly, no significant differences were found in the levels of quality of life and in the general self-efficacy perceptions. This might be the result of using self-reported and subjective assessments compared to more objective measures, such as the Clinical-Administered PTSD Scale (CAPS-5) and the Pittsburgh Sleep Quality Index. Previous meta-analysis (Cuijpers et al., 2010) indicated that clinician-rated instruments resulted in a significantly higher effect size compared to self-report instruments from the same studies in the assessment of depression symptoms. Similarly, Kramer and colleagues (2022) identified discrepancies between self-rated and clinician-administered measures of PTSD severity rates, corresponding with intensity and symptom severity scores; the symptoms were rated as more severe when self-rated by the patients, compared to clinicians' evaluations.

Therefore, although the findings presented above are based on a small and non-final sample of patients, it seems that the practice of TM was associated with a decrease in PTSD symptom severity and in an improvement in sleep quality among patients diagnosed with PTSD due to their military service. These findings raise the importance of continuing the study among a larger sample.

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