3. Pythagorean Self-Awareness serves effectively for Stress Management on Freshmen: A quasi-experimental study

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Abstract:

Adjustment to conditions surrounding the first year of studies in tertiary education can be highly stressful. Because of the pertinent challenges, University freshmen evidently run risks for developing mental and physical ailments probably undermining their entire wellbeing. Aims: This study evaluates effects of two preventive or/and corrective intervention methods dealing with their difficulties. Sample: Freshmen (N=60). Methods: In a parallel quasi-experimental design the above freshmen were randomly sub-grouped for attending to 8 consecutive weekly sessions of either Pythagorean Self-Awareness Intervention (PSAI) or Stress Management Techniques Intervention (SMTI). Several self-report measures were administered at pre- and post-intervention phases. Assessment included various factors: (a) psychological: stress, anxiety, depression, anger, emotionality, (b) physiological: Body-Mass-Index (BMI) via engaging in healthy habits, lifestyle, sleep, (c) basic cognitive: visuospatial memory, verbal learning and (d) complex mental: fatigue-vs-coherence, speed processing, self-efficacy. Results: Significant post-intervention improvements were noted for most dimensions, irrespective of group allocation. SMTI was superior to PSAI for reducing BMI and improving basic cognitive features, whereas PSAI was superior for improving psychological and complex mental processes. Conclusions: Results are encouraging to suggest these interventions be introduced in academic settings as effective meta-cognitive multifaceted procedures for stress management, to help students become more successful in their personal as well as academic lives.

Keywords:

Freshmen; Stress; Pythagorean Self-Awareness; Stress-Management Techniques

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Introduction:

To take University Entrance Examinations, and pass, is conceptualized as a "success story". This is partly true, since candidates also get fatigued in the process, while what lies ahead is largely unpredictable in both circumstantial/environmental demands and psychological/self-management terms. Transition to University life has been repeatedly shown to be particularly stressful, regarding several causal sources: temperamental, academic, economic, time- and self-management (Drake et al., 2016; Hunt and Eisenberg, 2010). Longitudinal studies report increased stress and/or mental health symptoms especially in freshmen (Saleh et al., 2017). Changes of this magnitude (Sheridan and Dunne, 2012; Patton et al., 2016) require drawing-upon inner strengths. Freshmen are vulnerable and prone to develop health complications (Pedrelli et al., 2016) in a fourfold typology of challenges: "weaning", "re-framing", "acclimatization", "establishment" (Yang and Brown, 2016). The topic seems never adequately covered, particularly in a rapidly changing world of evermore difficult demands – or is it that classic interventions are merely retroactive, rather than preventive, typically addressing surface-, rather than depth-issues, without systematic, timely, and indeed, meta-cognitive cues, by skipping superficial clues? (Paleologou, in press).

Undeniably, many freshmen are at high risk to develop psychopathological symptomatology (Allison, 2015). As a major life event, joining the University life is highly taxing (James et al., 2016), often triggering physical, cognitive, psychological and complex mental dysfunctions (Kötter et al., 2016) threatening health, careers and lives in their entirety. Worrying distress signs (Van Eck et al., 2017) and disquieting stress/anxiety indications tend to harm overall health, academic performance and interpersonal relationships (Beiter et al. 2015). Late interventions might not reverse burnout, study discontinuation and/or chronicity (Ahmed et al., 2009).

Freshmen of poor academic adjustment and burdened psycho-physiological profile exhibit: emotional "weakness" (Hunt and Eisenberg, 2010; Srivastava et al., 2009), low self-esteem (Lee et al., 2014), imbalanced identity-formation and low coherence (Sica et al., 2014), inability to form intimate relations (Wilson and Gillies, 2005), mismatch between subjective expectations and objective reality (Jackson et al., 2000), indices of physical and emotional vulnerability (Wintre et al., 2011). *In*

contrast, well-adjusted freshmen show: good health (Hystad et al. 2009; Paleologou, 2015), internal locus of control (Paleologou, 2015) satisfactory academic adjustment (Goldwurm et al., 2006), sense of happiness (Abdollahi et al., 2014), effective stress management (Coetzee and Harry, 2015). Notably, the adjustment stress affects decision-making and thinking strategies (Leder et al., 2013), inhibits (Petzold et al., 2010) and dys-regulates learning processes (Schwabe et al., 2008). Homesickness is also associated with low self-esteem, identity issues, and external locus of control (Tognoli, 2003).

Markedly, freshmen have more health complaints than their working counterparts, but do not seek appropriate help (Vaez et al., 2004). For example, in Germany, freshmen assessed for health-related life-quality, showed significantly decreased mental health scores compared to the general population norms (Kurré et al., 2011). Psychosomatic complaints are also documented in University students throughout Europe (Stock et al., 2008). Research demonstrates associations between sleep problems and depression and anxiety symptoms, especially during critical transition periods (Doane et al., 2015), although there is scant evidence on reciprocal relations over socio-contextual shifts. Poor sleep accompanies physical complaints, depression and fatigue (Lund et al., 2010), while fatigue *per se* – be it physical, cognitive, emotional, or their frequent combination – is '*an overwhelming sense of exhaustion and decreased energy for physical and mental activity, despite an adequate amount of sleep*' (NANDA, 2011). Freshmen are often less alert and motivated on cognitive tasks, and troubled on: attention-focusing, decision-making, thought-organizing, maintaining thinking clarity, coherence and speed when compared to their non-academic peers (Darcy et al., 2013). During chronic stress, the body enters a physiologically 'overdrive' which, if prolonged, causes a counter-effect, leading to fatigue (Khambatta and Jevon, 2011).

Intervention programs on attention-focusing, progressive muscle relaxation, cognitive-behavioral techniques (Dozois et al., 2009); mindfulness, transcendental meditation, abdominal breathing, biofeedback (Zeidan et al., 2010); Berkeley's and Humphreys' tactics (Marouda–Chatjoulis, 2003); and Bandura's practices (Kalantzi-Azizi et al., 2001); have all shown selective positive effects for lifestyle, psychosocial well-being or life-quality **[**extensive review in: Conley et al. (Conley et al., 2015) and Fernandez et al., 2016**],** yet scarcely presenting overall profile improvements. Prioritization of meta-cognitive preventive-plus-corrective interventions arises (Pedrelli et al., 2016). The aim of this study was to investigate whether systematic attendance to two distinct, structured stress management protocols would lead to all-encompassing, preventive-and-corrective improvements on students' physical, cognitive and mental health during the transition period into the tertiary education system. The two approaches implemented were: **A.** the inventive "*Pythagorean Self-Awareness*" intervention dictated by the Pythagorean philosophy, and **B.** an innovative synthesis of otherwise "classic" self-management/coping techniques. A cohort of assessment tools was administered to participants at pre- and post-intervention to monitor any profile changes in their psychological, physiological, basic cognitive and complex mental processes.

Material and Methods:

Study Design

This research was a non-blind quasi-experimental clinical trial on potential overall positive effects of an 8-week stress-management, health promotion intervention for freshmen in a Hellenic University setting (University of Ioannina). It was conducted from March to May 2016 under the auspices of the Self Lineation Special Laboratory of the Department of Philosophy, Pedagogy, and Psychology (Section of Psychology). No protocol changes were made after study commencement. With no follow-up period, both students and researcher remained non-blind to assignment and measurements.

Procedure

Participants: Participants were freshmen from different University Departments. Inclusion criteria involved: being freshmen, aged between 18-to-21, residents in the vicinity but of non-local origin, and facing subjective and/or objective mental and/or physical complaints due to personal inability to effectively manage adjustment stress. Exclusion criteria involved: comorbidity with a major psychiatric disease, substance abuse, any other serious organic disease significantly impairing cognitive functions, and participation in any psychotherapeutic or other stress-management treatment. The recruited students were selected using a convenience sampling technique. Participants were then randomly separated and assigned to the Pythagorean Self-Awareness Intervention (PSAI) group or the Stress Management Techniques Intervention (SMTI) group using an online random number generator (http://www.random.org). All eligible persons signed their informed consent. The study received ethical approval according to the Helsinki Declaration and was locally registered by the Universities of Ioannina and Athens.

Intervention: At baseline, and after securing inclusion and exclusion criteria, both groups received verbal and written information about the value of healthy lifestyle via stress management cognitive training for effective adjustment to the University life. Students in the first group attended to the PSAI intervention during 8 weekly sessions.

PSAI vs. SMTI

1st session: all students were initially assessed by standardized questionnaires and bodily measurements, followed by: familiarization with the Pythagorean concepts for the PSAI group and edification on cognitive training, healthy lifestyle and stress-management benefits for the SMTI group. As exercising incentive, a self-monitoring contemplative activity was given for consistent PSAI use, while a pedometer with instructions was given for regular SMTI use.

2nd session: PSAI participants were introduced to Pythagorean instructions on silence intervals, contemplative introspection and planning, and SMTI students participated in breathing and nutrition awareness training. Guidance on performing PSAI reflection techniques and pre-sleep recapitulations daily, and SMTI dietary habits, physical exercise and sleep were delivered respectively.

The 3rd session was evaluative for everyone, and students discussed practical issues and ideas that might had emerged during applying the pertinent practices stepwise. As hindering issues did not surface, exchange of best application ideas was enjoyed and everyone contributed constructively.

4th session: PSAI participants delved more on the Pythagorean techniques. All were asked to perform the learned PSAI procedures twice daily (*morning and bedtime*) after 5 minutes of diaphragmatic breathing. The SMTI students were to engage in progressive muscle relaxation (PMR) and abdominal breathing (AB) before bedtime and perform physical exercise and proper nutrition during daytime.

In the next three PSAI group sessions lectures about memory and serenity, lifestyle consistency and intrapersonal relationships improvements were given, along with proper expatiation on the Pythagoreanism. The SMTI students received training in guided imagery (GI), dietary and exercise regulation counseling, and cognitive restructuring (CR).

Apparently, both groups had their share on breathing, relaxation, visualization and daily activity regulation – only within markedly different context. All practices for all were initially performed under the researcher's supervision, the following exercises being later repeated individually, additionally aided by intervention tools that included: a) drawn charts b) informative brochures for stepwise approaches to implementation of exercises and c) a CD. The CD for the PSAI students contained 21 minute long audio instructions for awareness breathing, introspection and visualization on self-regulation, while the SMTI students' CD contained 20 minute long audio instructions for AB and PMR, and GI. During the final session final assessments were made including body measurements and a deep discussion about the techniques and their benefits closed the intervention course.

All participants, instructed to practice twice daily the assigned tasks, brought written and recorded material on their performance results every next session.

Pythagorean Self-Awareness Intervention (PSAI).

The PSAI was practiced twice daily, in the morning and at bedtime, in a quiet place. The practice content (http://en.wikipedia.org/wiki/The_golden_verses_of_Pythagoras) as based on *The Golden Verses* of the Greek philosopher Pythagoras, served as a frame of reference for activity engagement.

At night, each individual followed three cognitive processes: *firstly, recall, from a 3rd person perspective*, every daily event in the exact time sequence that it happened, as if s/he could see his/herself in a "movie". To facilitate recall, events were categorized as: diet, exercise, sleep, interrelations. *Secondly, choose* the important events and remember all details accompanying them. For the categories of diet, exercise and sleep, the details were straightforward. However, for interrelations, the individual would select those of any particular personal or emotional significance. *Thirdly, critically appraise the selected experiences* by scrutinizing each selected event under three questions: *"Was what I have done wrong? Was what I have done right? What have I omitted that I ought to have done?"* The individual is to remain detached from emotional burdens and contemplate on the performed actions as if s/he were a "judge" of him/herself. On nutrition and breathing awareness guidance was given early, during the 2nd session. Events or choices pertinent to interrelations were freely-judged, since the primary goal was to enhance self-awareness, not criticizing. Ergo, illustratively through positive (rejoice) and negative (reprimand) self-reinforcement, the individual was to set specific goals for the next day, and to recapitulate the results of the previous night's practice in the morning, without repeating the procedure.

Self-report measures: We administered several self – report measures as follows. The following questionnaires were completed pre- and post-intervention:

A Demographic Questionnaire: Data on socio-demographic variables (sex, age, education, family, and health status).

The Healthy Lifestyle and Personal Control Questionnaire (HLPCQ) comprised from 26 items answered in a 4-point scale (Darviri et al., 2014). Cronbach's a-coefficients pre- and post-intervention were 0.854 and 0.936, respectively.

Depression Anxiety Stress Scale (DASS-21): The instrument (Lovibond and Lovibond, 1995) has been adapted to the Greek population (Lyrakos et al., 2011). Cronbach's a-coefficients for depression, anxiety and stress were respectively 0.801, 0.814, 0.877 and 0.723, 0.773, 0.825 for pre- and post-interventions.

The Pittsburgh Sleep Quality Index (PSQI) evaluates seven discrete sleep-domains: quality, latency, duration, efficiency, disturbances, use of medications, and daytime dysfunction, as well as a global score (Mollayeva et al., 2016).

The State-Trait Anger Expression Inventory (STAXI) is comprised of 24 anger items accessing anger-in, anger-out and anger-control (Spielberger et al., 1985). It has been standardized in Greece

(Anagnostopoulou and Kioseoglou, 2012). Pre- and post-intervention Cronbach's alpha-coefficients were 0.621, 0.688, 0.867 and 0.877, 0.481, 0.898 respectively.

The Wong's Emotional Intelligence Scale (WEIS) (Wong and Law, 2002) has also been validated in Greece (Kafetsios, 2012). Cronbach's alphas pre- and post-intervention were 0.893 and 0.954 respectively.

The General Self-Efficacy Scale (Schwarzer and Jerusalem, 1995) has similarly has been standardized in Greece (Glynou et al., 1994). Cronbach's alphas pre and post were 0.834 and 0.947 respectively.

The Sense of Coherence Scale (SOC) is a 13-item instrument measuring Comprehensibility, Manageability, and Meaningfulness (Antonovsky, 1993). Likewise, it has been standardized in Greece (Anagnostopoulou, 2012). Cronbach's alphas pre- and post-intervention were 0.627 and 0.923, respectively.

Other-report measures: We also included other report measures (cognitive tests) to obtain independent sources of information about participants' levels of cognitive state.

The Symbol Digit Modalities Test (SDMT) assesses information processing and psychomotor speed, attention, working memory. It is a written-task test that requires use of a reference key to pair numbers to geometric figures as quickly as possible in 90 seconds (Smith, 1982).

The California Verbal Learning Test-II (CVLT-II) evaluates verbal memory, verbal learning, and executive functioning. Verbal recall of 16 words is tested over five learning trials. Then, a second distractor word list is presented once, after which short-delay free recall of the first word list is tested. Long-delay free recall and recognition of the initial word list is also assessed (Delis et al., 2000).

The Brief Visuospatial Memory Test-Revised (BVMT-R) is a drawing task that requires accurate reproduction of six geometric figures from memory (after viewing stimuli for 10 sec) over three learning trials. Delayed free recall of the figures is tested after 25 min (Benedict et al., 1996).

Fatigue (physical, mental, cognitive) assessment was made using a visual analog scale of a 10 cm long straight line numbered from 0 to 10 cm. The individual level of fatigue during past week is indicated by marking these lines (Darviri et al., 2016).

Results:

Statistical Analyses:

Baseline demographic and outcome data were presented as means, standard deviations (SD), or frequencies within groups. Between-group comparisons **[in this study one experimental group was acted as control group for the other, so as to obtain more accuracy and precision of statistical results**] for baseline data were performed using Pearson's chi-square and Student's t-tests for categorical and interval characteristics, respectively (see Tables 1,2). All analyses were performed in line with the intention-to-treat principle using the **L**ast **O**bservation **C**arried **F**orward method (**LOCF**).

Changes in outcome measures from baseline to 8 weeks (or rate of outcome change) were analyzed using linear mixed-effects models with interaction terms for study group and time points. Random intercepts were used for the random effect of each participant in the model using variance components structure. The models' formula was the following:

$$\mathbf{Y_{ti} = b_0 + b_1(TIME_{ti}) + b_2(GROUP_i) + b_3\ (GROUP_i)\times(TIME_{ti}) + b'_0 + e_{ti}}$$

where $\mathbf{Y_{ti}}$ is the outcome, $\mathbf{b_0}$ is the intercept, b_1, b_2, b_3, are the fixed coefficients, $\mathbf{b'_0}$ is the random coefficient for intercept, $\mathbf{TIME_{ti}}$ is the time point (**t**) for each individual (**i**), $\mathbf{GROUP_i}$ is the intervention condition and $\mathbf{e_{ti}}$ is the time specific residual of the model. The $\mathbf{H_0}$ null hypothesis of interest was $\mathbf{b_3=0}$. By coding the SMTI group and baseline time as zeros (intervention and follow-up time as one) $\mathbf{b_3}$ represents the difference of the average rate of outcome of the PSAI group relative to the SMTI group. Analyses were conducted with software SPSS 22.0 (Chicago, IL).

Results:

The participant flow chart is shown in Figure1. Seventy-one freshmen were invited to participate and informed about the study's purpose. Sixty-seven accepted. Six were excluded (two due to current psychiatric medication use, one with signs of psychosis, and three who were in psychotherapy).

Tables 1 and 2 present baseline measurements for all the outcomes scores. The lack of randomization resulted in four significant baseline differences. Firstly, students in the PSAI group were more stressed and depressed than those in the SMTI group (p=0.04 and 0.03, respectively) and showed better verbal learning and visuospatial memory performance (p=0.001 and 0.01, respectively). Tables 3 and 4 present the results of the mixed-effects models. Significant group differences for stress, anxiety, verbal learning and visuospatial memory represent mainly the baseline group differences for these outcomes. Coefficients for time reveal post-intervention significant improvements for BMI, lifestyle and personal control, stress, depression, emotional intelligence, self-efficacy, sense of coherence, physical and mental fatigue, cognitive speed processing, verbal learning and visuospatial memory, irrespective of group allocation. The SMTI group was found

superior by statistical significance to PSAI for reducing BMI and improving visuospatial memory at post-intervention; PSAI was found superior for reducing anger-in, cognitive fatigue and improving anger-control, sense of coherence and cognitive speed processing.

Discussion:

Strengths and limitations

This quasi experimental study was conducted to assess the effectiveness of an 8-week stress-management and health promotion program in freshmen based on two distinct approaches – the *Pythagorean Self-Awareness Intervention* (PSAI), and *Stress Management Techniques Intervention* (SMTI) – **applied for the first time worldwide to these target groups.** Training and respective measurements included AB, PMR, GI, CR and healthy lifestyle counseling. Both techniques were chosen because they are considered simple, easy-taught and feasible for integration in daily life.

Significant post-intervention improvements were noted for BMI, lifestyle, stress, depression, emotional intelligence, self-efficacy, coherence, physical and mental fatigue, cognitive speed processing, verbal learning and visuospatial memory, irrespective of group allocation. Also, SMTI was superior to PSAI for reducing BMI and improving visuospatial memory. PSAI was found superior to SMTI for reducing anger-in, cognitive fatigue and improving anger-control, coherence and cognitive speed processing.

PSAI is designed to address three fundamental treatment aspects of stress adjustment: *meaningfulness*, *management*, *empowerment*. The results validate the original idea. All participants liked this technique and reported no side effects or rebuffs. Qualitative data also gathered lie beyond the present scope. PSAI participants reported higher: optimism, sociability, self-confidence and awareness, healthy lifestyle, happiness, setting limits, better sleep. *Being a newly introduced intervention, its recorded benefits could be explained only by heuristic interpretations made on the basis of available evidence and putative analogies with other well-established interventions*, emphasizing on: healthy lifestyle, emotional defusion and cognitive empowerment. A kernel of truth in PSAI was stress management. To us, it was accomplished by the diaphragmatic breathing and the **cognitive (re)appraisal**. PSAI expresses meta-cognition, an increased awareness of **one's own cognition and private self-monitoring**. Personal memory plays essential role, providing all necessary data-recollections for facilitating *self-judgment,* and *decision making*, thus encouraging constructive concentration on hassles recognized as emotional "burden", and therefore allowing for more targeted self-improvement processes based *on Comprehensibility*, which, in turn, seem to enable modification of maladjusted schemata.

Anxiety manifests with emotional (e.g. low emotional intelligence, anger) and behavioral changes (e.g. unhealthy dietary choices) as an aberrant stress-response. Anxiety disorders in freshmen could be associated and interplay with poor health and life-quality. Our results reveal a reduction in anxiety levels. The PSAI, *via cognitive appraisal*, may strengthen coherence and self-awareness, thus resulting in more effective self-management, self-efficacy, comprehensibility, manageability. Contemporary studies find selective positive effects on freshmen's health profiles after limited scope interventions at follow-ups (Allison, 2015; Beiter et al., 2015). The stress-management sessions applied here could prove beneficial for broader improvements.

Anxiety and Depression of freshmen have been linked to stress and highlighted the dire need for apt interventions (Millett and Thompson, 2017; Horgan et al., 2016; Lu et al., 2015). In the PSAI, effort recall could explain this reduction. The Person sets all emotional affairs in order, shortly before s/he goes to bed, so is relieved from the "toxic" emotionality. The PSAI, guided by the Golden Verses, primarily empowers coherence, through positive and negative auto-reinforcement. "*Introspection*", "*Emotional Intelligence*" and "*Self-judgment*" are its *virtual cornerstones*. The inner experience of thoughts and feelings, straddles between Philosophy and Psychology. PSAI boosts a pristine inner-self-regulation experience process, imposing internal talk and contemplation, thus activating ventral brain areas, especially of the left hemisphere (Kross et al., 2014; Guendelman et al., 2017).

Sleep disorders were reduced in the PSAI group. PSA connected with physical tranquility and mental serenity. Freshmen are inclined to sleep disorders and contemporary literature shows that physical activity could help to a better sleep (Hurdiel et al., 2017). Quality of sleep predicts well-being and better university-adjustment (Sajadi et al., 2016; Doerr et al., 2015).

Fatigue, usually related to negativism, anger-expression, depression, and sleep disorders (Wibrowski et al., 2016; Cevik and Altun, 2016) is multifactorial and critical for emotional and physical burdens on freshmen life, and becomes apparent when individuals might perform well in standardized tasks, but face difficulties in attention and planning. There is a well-known relationship among stress, fatigue, and dysregulation of the HPA axis (Tozzi et al., 2016; Obasi et al., 2017). Here, the levels of fatigue were significantly lowered, revealing PSAI's impact on the mitigation of the effects of stress and depression.

To our knowledge, there is no *direct* evidence that stress management can improve cognitive function in freshmen. We hypothesize that stress alleviation could reverse the inflammatory process and the ensuing neuro-degeneration (Di Paolo and Shayakhmetov, 2016; Fleshner et al., 2017). Here, the significant differences for information processing speed and verbal learning and not for visuospatial memory, indicate that certain domains of cognition may be more amenable to change. Similarly, there is scarce evidence attesting that memory training enhances memory function, and

only speculations on cognitive training ability to activate brain networks representing cognitive reserve (Voss et al., 2010).

The combination of the selected intervention-methods has not been previously tested. The encouraging fact that no participant abandoned the program strongly shows it is a well-tolerated intervention, easily-incorporated in daily routine. But, admittedly, bares some limitations. The study was not-blinded to possibly confirm adherence merely due to the program. Participants were mainly females and recruited in only one, non-urban, University. All measurements were self-report, thus always liable to bias. We did not ascertain if benefits were steadily maintained after-intervention. Cognitive reserve was not taken into account.

Both methods hold promise for changes. *The strong advantages of PSAI* include that it is: easily taught; time-and money-saving; and potentially applicable for a lifetime after training completion. Further studies with larger sample-sizes should be undertaken. We certainly encourage replication on more heterogeneous groups and against a control-group.

Directions for Implementation and Future Research:

The intervention protocols adopted here can lower stress and improve wellbeing, without special requirements for equipment or infrastructure. They could easily be incorporated in tertiary education making a meaningful contribution to the mental and physical health of freshmen, providing them with useful coping-strategies. In the future, we hope that researchers will consider multiple sources of information when making assessments of academic stress, especially in freshmen. **We also recommend Pythagorean Awareness as an innovative and fruitful Stress-Management Technique**.

References:

- Abdollahi, A., Abu Talib, M., Yaacob, S. N., & Ismail, Z. (2014). Hardiness as a mediator between perceived stress and happiness in nurses. *Journal of psychiatric and mental health nursing*, *21*(9), 789-796. Doi: http://dx.doi.org/10.1111/jpm.12142
- Ahmed, I., Banu, H., Al-Fageer, R., & Al-Suwaidi, R. (2009). Cognitive emotions: depression and anxiety in medical students and staff. *Journal of critical care*, *24*(3), e1-e7. Doi: http://dx.doi.org/10.1016/j.jcrc.2009.06.003
- Allison, K. D. (2015). *Stress, anxiety symptomology, and the need for student support services for university freshmen of first-generation status, low-SES backgrounds, and those registered with disabilities*. [Doctoral dissertation]. Louisiana: Xavier University.
- Anagnostopoulou, T., & Kioseoglou, G. (2012). State-Trait Anger Expression Inventory, in A. Stalikas, S. Triliva, and P. Roussi (Eds.), *The psychometric instruments in Greece: A comprehensive collection and*

presentation of questionnaires, tests, instruments and assessment kits in Greece, p. 576. Athens: Topos Publications [in Greek].

— Anagnostopoulou T. (2012). Sense of Coherence Scale, in A. Stalikas, S. Triliva, and P. Roussi (Eds.), *The psychometric instruments in Greece: A comprehensive collection and presentation of questionnaires, tests, instruments and assessment kits in Greece*, p. 576. Athens: Topos Publications [in Greek].

— Antonovsky, A. (1993). The structure and properties of the sense of coherence scale. *Social science & medicine*, *36*(6), 725-733. Doi: http://dx.doi.org/10.1016/0277-9536(93)90033-Z

— Beiter, R., Nash, R., McCrady, M., Rhoades, D., Linscomb, M., Clarahan, M., & Sammut, S. (2015). The prevalence and correlates of depression, anxiety, and stress in a sample of college students. *Journal of Affective Disorders*, *173*, 90-96. Doi: http://dx.doi.org/10.1016/j.jad.2014.10.054

— Benedict, R. H., Schretlen, D., Groninger, L., Dobraski, M., & Shpritz, B. (1996). Revision of the Brief Visuospatial Memory Test: Studies of normal performance, reliability, and validity. *Psychological Assessment*, *8*(2), 145. Doi: http://dx.doi.org/10.1037/1040-3590.8.2.145

— Cevik, V., & Altun, A. (2016). Roles of working memory performance and instructional strategy in complex cognitive task performance. *Journal of Computer Assisted Learning*, *32*(6), 594-606. Doi: https://doi.org/10.1111/jcal.12156

— Coetzee, M., & Harry, N. (2015). Gender and hardiness as predictors of career adaptability: an exploratory study among Black call centre agents. *South African Journal of Psychology*, *45*(1), 81-92. Doi: https://doi.org/10.1177/0081246314546346

— Conley, C. S., Durlak, J. A., & Kirsch, A. C. (2015). A meta-analysis of universal mental health prevention programs for higher education students. *Prevention Science*, *16*(4), 487-507. Doi: https://doi.org/10.1007/s11121-015-0543-1

— Darcy, A., Roe, S., McKnight, F., & Nolan, C. (2013). *Fatigue in College Students*. [Unpublished Thesis Dissertation]. Dublin: Trinity College.

— Darviri, C., Alexopoulos, E. C., Artemiadis, A. K., Tigani, X., Kraniotou, C., Darvyri, P., & Chrousos, G. P. (2014). The Healthy Lifestyle and Personal Control Questionnaire (HLPCQ): a novel tool for assessing self-empowerment through a constellation of daily activities. *BMC public health*, *14*(1), 995.Doi: https://doi.org/10.1186/1471-2458-14-995

— Darviri, C., Zavitsanou, C., Delikou, A., Giotaki, A., Artemiadis, A., Anagnostouli, M., & Chrousos, G. P. (2016). Pythagorean Self-Awareness Serves Successfully as a New Cognitive Behavioral-Based Technique in Multiple Sclerosis Physical and Psychosocial Well-Being and Quality of Life. *Psychology, 7*(04): 572. Doi: https://doi.org/10.4236/psych.2016.74059

— Delis, D. C., Kramer, J. H., Kaplan, E., & Ober, B. A. (2000). *CVLT-II: California Verbal Learning Test: Adult Version*. Psychological Corporation.

— Di Paolo, N. C., & Shayakhmetov, D. M. (2016). Interleukin 1 [alpha] and the inflammatory process. *Nature Immunology*, *17*(8), 906-913. Doi: https://doi.org/10.1038/ni.3503

— Doane, L. D., Gress-Smith, J. L., & Breitenstein, R. S. (2015). Multi-method assessments of sleep over the transition to college and the associations with depression and anxiety symptoms. *Journal of youth and adolescence*, *44*(2), 389-404. Doi: https://doi.org/10.1007/s10964-014-0150-7

- Doerr, J. M., Ditzen, B., Strahler, J., Linnemann, A., Ziemek, J., Skoluda, and Hoppmann, C.A., and Nater, U. M. (2015). Reciprocal relationship between acute stress and acute fatigue in everyday life in a sample of university students. *Biological psychology 110*, 42-49. **Doi:** http://dx.doi.org/10.1016/j.biopsycho.2015.06.009
- Dozois, D. J., Seeds, P. M., & Collins, K. A. (2009). Transdiagnostic approaches to the prevention of depression and anxiety. *Journal of Cognitive Psychotherapy*, *23*(1), 44-59.. **Doi:** https://doi.org/10.1891/0889-8391.23.1.44
- Drake, E. C., Sladek, M. R., & Doane, L. D. (2016). Daily cortisol activity, loneliness, and coping efficacy in late adolescence: A longitudinal study of the transition to college. *International Journal of Behavioral Development*, *40*(4), 334-345.. Doi: http://dx.doi.org/10.1177/0165025415581914
- Fernandez, A., Howse, E., Rubio-Valera, M., Thorncraft, K., Noone, J., Luu, X., Veness, B., Leech, M., Llewellyn, G., & Salvador-Carulla, L. (2016). Setting-based interventions to promote mental health at the university: a systematic review. *International Journal of Public Health 61(7)*, 797-807. Doi: https://doi.org/10.1007/s00038-016-0846-4
- Fleshner, M., Frank, M., & Maier, S. F. (2017). Danger signals and inflammasomes: stress-evoked sterile inflammation in mood disorders. *Neuropsychopharmacology, 42(1)*, 36-45.Doi: https://doi.org/10.1038/npp.2016.125
- Glynou, E., Schwarzer, R. & Jerusalem M. (1994). Greek Adaptation of the General Self-Efficacy Scale, URL (October, 2015): http://userpage.fu-berlin.de/gesund/publicat/ehps_cd/health/greek.htm
- Goldwurm, G. F., Bielli, D., Corsale, B., & Marchi, S. (2006). Optimism training: Methodology and results. *Homeostasis In Health And Disease 44*(1–2), 27–33.
- Guendelman, S., Medeiros, S., & Rampes, H. (2017). Mindfulness and Emotion Regulation: Insights from Neurobiological, Psychological, and Clinical Studies. *Frontiers in Psychology*, *8*..Doi: https://doi.org/10.3389/fpsyg.2017.00220
- Horgan, A., Sweeney, J., Behan, L., & McCarthy, G. (2016). Depressive symptoms, college adjustment and peer support among undergraduate nursing and midwifery students. *Journal of Advanced Nursing*, *72*(12), 3081-3092. Doi: http://dx.doi.org/10.1111/jan.13074
- Hunt, J., & Eisenberg, D. (2010). Mental health problems and help-seeking behavior among college students. *Journal of Adolescent Health*, *46*(1), 3-10. Doi: http://dx.doi.org/10.1016/j.jadohealth.2009.08.008
- Hurdiel, R., Watier, T., Honn, K., Pezé, T., Zunquin, G., & Theunynck, D. (2017). Effects of a 12-week physical activities programme on sleep in female university students. *Research in Sports Medicine*, *25*(2), 191-196. Doi: http://www.tandfonline.com/doi/full/10.1080/15438627.2017.1282354
- Hystad, S. W., Eid, J., Laberg, J. C., Johnsen, B. H., & Bartone, P. T. (2009). Academic stress and health: Exploring the moderating role of personality hardiness. *Scandinavian journal of educational research*, *53*(5), 421-429. Doi: http://dx.doi.org/10.1080/00313830903180349
- Jackson, L. M., Pancer, S., Pratt, M. W., & Hunsberger, B. E. (2000). Great Expectations: The Relation Between Expectancies and Adjustment During the Transition to University1. *Journal of Applied Social Psychology*, *30*(10), 2100-2125. Doi: http://dx.doi.org/10.1111/j.1559-1816.2000.tb02427

- James, D., Sebren, A., DerAnanian, C., Bruening, M., Rooney, L., Araas, T., & Swan, P. D. (2016). Associations Among Self-Compassion, Eating Behaviors, and Stress in College Freshmen. *Journal of Basic and Applied Sciences*, *12*, 92-97. Doi: http://dx.doi.org/10.6000/1927-5129.2016.12.14
- Kafetsios, K. (2012). Emotional Intelligence Scale - Wong and Law, in A. Stalikas, S. Triliva, and P. Roussi (Eds.), *The psychometric instruments in Greece: A comprehensive collection and presentation of questionnaires, tests, instruments and assessment kits in Greece*, p. 424. Athens: Topos Publications [in Greek].
- Kalantzi-Azizi, A., Karademas, E., Sotiropoulou, G. A (2001). Cognitive behavioral programme of group intervention in student population for supporting their expectations of self-efficacy. *Psychologia 8(2)*, 267-80. [In Greek].
- Khambatta, C. & Jevon N. (2011). *Fatigue: The Essential Guide*. Peterborough: Need2Know.
- Kötter, T., Tautphäus, Y., Obst, K. U., Voltmer, E., & Scherer, M. (2016). Health-promoting factors in the freshman year of medical school: a longitudinal study. *Medical education*, *50*(6), 646-656.. Doi: http://dx.doi.org/10.1111/medu.12987
- Kross, E., Bruehlman-Senecal, E., Park, J., Burson, A., Dougherty, A., Shablack, H., Bremner, R., Mojer, J., & Ayduk O. (2014). Self-talk as a regulatory mechanism: how you do it matters. *Journal of Personality and Social Psychology 106(2),* 304. Doi: http://psycnet.apa.org/doi/10.1037/a0035173
- Kurré, J., Scholl, J., Bullinger, M., & Petersen-Ewert, C. (2011). Integration and health-related quality of life of undergraduate medical students with migration backgrounds. Results of a survey. *GMS Psycho-Social-Medicine*, *8*. Doc07 doi: http://dx.doi.org/10.3205/psm000076.
- Leder, J., Häusser, J. A., & Mojzisch, A. (2013). Stress and strategic decision-making in the beauty contest game. *Psychoneuroendocrinology*, *38*(9), 1503-1511. Doi: http://dx.doi.org/10.1016/j.psyneuen.2012.12.016
- Lee, C., Dickson, D. A., Conley, C. S., & Holmbeck, G. N. (2014). A closer look at self-esteem, perceived social support, and coping strategy: a prospective study of depressive symptomatology across the transition to college. *Journal of Social and Clinical Psychology*, *33*(6), 560-585.. Doi: http://dx.doi.org/10.1521/jscp.2014.33.6.560
- Lovibond, S.H. & Lovibond, P. (1995). *Manual for the Depression Anxiety Stress Scales* (2nd Ed.). Sydney: Psychology Foundation.
- Lu, W., Bian, Q., Song, Y. Y., Ren, J. Y., Xu, X. Y., & Zhao, M. (2015). Prevalence and related risk factors of anxiety and depression among Chinese college freshmen. *Journal of Huazhong University of Science and Technology [Medical Sciences] 35(6)*, 815-822. Doi: http://dx.doi.org/10.1007/s11596-015-1512-4
- Lund, H. G., Reider, B. D., Whiting, A. B., & Prichard, J. R. (2010). Sleep patterns and predictors of disturbed sleep in a large population of college students. *Journal of adolescent health 46(2)*, 124-132.Doi: http://dx.doi.org/10.1016/j.jadohealth.2009.06.016
- Lyrakos, G. N., Arvaniti, C., Smyrnioti, M., and Kostopanagiotou, G. (2011). P03-561-Translation and validation study of the depression anxiety stress scale in the greek general population and in a psychiatric patient's sample. *European Psychiatry 26*, 1731. Doi: http://dx.doi.org/10.1016/S0924-9338(11)73435-6

- Marouda–Chatjoulis, A. (2003). A proposal for a problem solving process model for counseling in personal dilemmas and conflicts. *Psychologia 10(2-3),* 310-29. [In Greek].
- Millett-Thompson, A. (2017). Dealing With College Students' Stress, Anxiety, and Depression. *The Journal for Quality and Participation 39(4),* 24.
- Mollayeva, T., Thurairajah, P., Burton, K., Mollayeva, S., Shapiro, C. M., & Colantonio, A. (2016). The Pittsburgh sleep quality index as a screening tool for sleep dysfunction in clinical and non-clinical samples: a systematic review and meta-analysis*. Sleep medicine reviews 25*,52-73. Doi: http://dx.doi.org/10.1016/j.smrv.2015.01.009
- NANDA International. (2011). *Nursing Diagnosis - Definitions and Classifications, 2012-2014*. Hoboken, NJ: Wiley-Blackwell.
- Obasi, E. M., Shirtcliff, E. A., Cavanagh, L., Ratliff, K. L., Pittman, D. M., & Brooks, J. J. (2017).Hypothalamic-Pituitary-Adrenal Reactivity to Acute Stress: an Investigation into the Roles of Perceived Stress and Family Resources. *Prevention Science, 1-9.* Doi: http://dx.doi.org/10.1007/s11121-017-0759-3
- Paleologou, A.M. (In press). *Clinical Psychology and Psychotherapy Re-Orientations*. Athens: Gutenberg Publications.
- Paleologou, A.M. (2015). *Protocols of Seminars on the Meta-cognitional HardySurge Proactive Health Methodology*. Ioannina: University of Ioannina Press.
- Patton, L.D., Renn, K.A., Guido, F.M., Quaye, S.J., Evans, N.J. & Forney, D.S. (2016). *Student development in college: Theory, research, and practice* [2nd Ed.] San Fransisco: John Wiley and Sons.
- Pedrelli, P., Shapero, B., Archibald, A., & Dale, C. (2016). Alcohol use and depression during adolescence and young adulthood: a summary and interpretation of mixed findings. *Current addiction reports 3(1),* 91-97. Doi: http://dx.doi.org/10.1007/s40429-016-0084-0
- Petzold, A., Plessow, F., Goschke, T., & Kirschbaum, C. (2010). Stress reduces use of negative feedback in a feedback-based learning task. *Behavioral neuroscience 124(2)*, 248. Doi: http://psycnet.apa.org/doi/10.1037/a0018930
- Sajadi, S. A., Farsi, Z., Rajaei, N., Mazhari, M. S., & Habibi, H. (2016). Sleep quality and the factors affecting the fatigue severity and academic performance of students at AJA University of Medical Sciences. *Journal of Advances in Medical Education (JAMED) 1(2),*9-15.
- Saleh, D., Romo, L., & Camart, N. (2017). Is Perceived Stress of French University Students Related to Personality Traits? *Psychology 7(1),* 42-49. Doi: http://dx.doi.org/10.17265/2159-5542/2017.01.004
- Schwabe, L., Dalm, S., Schächinger, H., & Oitzl, M. S. (2008). Chronic stress modulates the use of spatial and stimulus-response learning strategies in mice and man. *Neurobiology of learning and memory 90(3),* 495-503. Doi: http://dx.doi.org/10.1016/j.nlm.2008.07.015
- Schwarzer, R., & Jerusalem, M. (1995). Generalized Self-Efficacy scale in J. Weinman, S. Wright, and M. Johnston (Eds.), *Measures in health psychology: A user's portfolio. Causal and control beliefs* ,pp. 35-37. Windsor, UK: NFER-NELSON.
- Sheridan, V., & Dunne, S. (2012). The bigger picture: undergraduate voices reflecting on academic transition in an Irish university. *Innovations in Education and Teaching International 49(3)*, 237-247. Doi: http://dx.doi.org/10.1080/14703297.2012.703019

- Sica, L. S., Sestito, L. A., & Ragozini, G. (2014). Identity coping in the first years of university: Identity diffusion, adjustment and identity distress. *Journal of Adult Development 21(3)*, 159-172. Doi: http://dx.doi.org/10.1007/s10804-014-9188-8
- Smith, A. (1982). *Symbol Digit Modalities Test (SDMT) Manual (Revised).* Los Angeles: Western Psychological Services.
- Spielberger, C.D., Johnson, E.H., Russell, S.F., Crane, R.J., Jacobs, G.A. & Worden, T.J. (1985). The experience and expression of anger: Construction and validation of an anger expression scale, in M.A. Chesney and R.H. Rosenman (Eds.), *Anger and hostility in cardiovascular and behavioral disorders*, p.50. New York: Hemisphere.
- Srivastava, S., Tamir, M., McGonigal, K. M., John, O. P., & Gross, J. J. (2009). The social costs of emotional suppression: a prospective study of the transition to college. *Journal of personality and social psychology 96(4)*, 883. Doi: http://dx.doi.org/10.1037/a0014755
- Stock, C., Mikolajczyk, R.T., Bilir, N., Petkeviciene, J., Naydenova, V., Dudziak, U., Marin-Fernandez, B., & El Ansari, W. (2008). Gender differences in health complaints among students across European countries: Results from a survey in seven European countries. *Journal of Public Health 16*, 353-360. Doi: http://dx.doi.org/10.1007/s10389-007-0173-6
- Tognoli, J. (2003). Leaving home: Homesickness, place attachment, and transition among residential college students. *Journal of College Student Psychotherapy 18(1),* 35-48. Doi: http://dx.doi.org/10.1300/J035v18n01_04
- Tozzi, A., Zare, M., & Benasich, A. A. (2016). New Perspectives on Spontaneous Brain Activity: Dynamic Networks and Energy Matter. *Frontiers in Human Neuroscience 10*, 247. Doi: http://dx.doi.org/10.3389/fnhum.2016.00247
- Vaez, M., Kristenson, M., & Laflamme, L. (2004). Perceived quality of life and self-rated health among first-year university students. *Social Indicators Research 68(2),* 221-234. Doi: http://dx.doi.org/10.1023/B:SOCI.0000025594.76886.56
- Van Eck, K., Warren, P., & Flory, K. (2017). A variable-centered and person-centered evaluation of emotion regulation and distress tolerance: links to emotional and behavioral concerns. *Journal of youth and adolescence 46(1)*, 136-150. Doi: http://dx.doi.org/10.1007/s10964-016-0542-y
- Voss, M.W., Prakash, R.S., Erickson, K.I., Basak, C., Chaddock, L., Kim, J.S., Alves, H., Heo, S., Szabo, A.N., White, S.M., Wójcicki, T.R., Mailey, E.L., Gothe, N., Olson, E.A., McAuley, E. & Kramer, A. (2010). Plasticity of brain networks in a randomized intervention trial of exercise training in older adults. *Frontiers in aging neuroscience 2,* 32. Doi: https://doi.org/10.3389/fnagi.2010.00032
- Wibrowski, C. R., Matthews, W. K., & Kitsantas, A. (2016). The Role of a Skills Learning Support Program on First-Generation College Students' Self-Regulation, Motivation, and Academic Achievement: A Longitudinal Study. *Journal of College Student Retention*: *Research, Theory and Practice, 1521025116629152*. Doi: https://doi.org/10.1177/1521025116629152
- Wilson, G., & Gillies, R. M. (2005). Stress Associated With the Transition From High School to University: The Effect of Social Support and Self-Efficacy. *Australian Journal of Guidance and Counselling 15(01)*, 77-92. Doi: https://doi.org/10.1375/ajgc.15.1.77

— Wintre, M. G., Ames, M. E., Pancer, S. M., Pratt, M. W., Polivy, J., Birnie-Lefcovitch, S., & Adams, G. R. (2011). Parental divorce and first-year students' transition to university: The need to include baseline data and gender. *Journal of Divorce and Remarriage 52(5*), 326-343. Doi: http://dx.doi.org/10.1080/10502556.2011.585090
— Wong, C. S., & Law, K. S. (2002). The effects of leader and follower emotional intelligence on performance and attitude: An exploratory study. *The leadership quarterly 13(3),* 243-274. Doi: http://dx.doi.org/10.1016/S1048-9843(02)00099-1
— Yang, C. C., & Brown, B. B. (2016). Online self-presentation on Facebook and self development during the college transition. *Journal of youth and adolescence 45(2),* 402-416. Doi: http://dx.doi.org/10.1007/s10964-015-0385-y
— Zeidan, F., Johnson, S. K., Diamond, B. J., David, Z., & Goolkasian, P. (2010). Mindfulness meditation improves cognition: Evidence of brief mental training. *Consciousness and cognition 19(2)*, 597-605. Doi: http://dx.doi.org/10.1016/j.concog.2010.03.014

Tables

Table 1

Baseline outcome characteristics (N=60)[1]

Characteristic	PSAI group (N=30)	SMTI group (N=30)	p value
Mean BMI ± SD (Kg/m2)	22.0 ± 3.8	23.5 ± 4.1	0.15
Mean HLPCQ ± SD	57.7 ± 11.5	60.9 ±11.3	0.29
Mean Stress ± SD	9.6 ± 5.2	7.0 ± 9.6	0.04*
Mean Anxiety ± SD	5.7 ± 4.7	3.4 ± 3.2	0.03*
Mean Depression ± SD	6.5 ± 4.8	5.3 ± 3.7	0.31
Mean Anger In ± SD	16.6 ± 3.6	16.5 ± 3.7	0.92
Mean Anger Control ± SD	20.6 ± 5.4	22.3 ± 4.7	0.19
Mean Emotional Intelligence ± SD	26.4 ± 5.0	79.6 ±12.3	0.25
Mean Self-Efficacy ± SD	28.4 ± 3.7	26.4 ± 6.5	1.0
Mean Coherence ± SD	51.9 ± 7.9	54.8 ± 8.7	0.19

***Note*:** BMI: Body Mass Index, HLPCQ: Healthy Lifestyle and Personal Control Questionnaire, SD: Standard Deviation, [1]Student's t-test, *p<0.05

Table 2

Baseline outcome characteristics (N=60)[1]

Characteristic	PSAI group (N=30)	SMTI group (N=30)	p value
Mean Physical Fatigue ± SD (mm)	56.3 ± 2.4	57.3 ± 2.3	0.12
Mean Cognitive Fatigue ± SD (mm)	6.0 ± 2.4	5.6 ± 2.0	0.60
Mean Mental Fatigue ± SD (mm)	67.9 ± 6.2	69.5 ± 7.9	0.37
Mean PSQI ± SD	5.4 ± 2.9	4.6 ± 2.6	0.26
Mean SDMT ± SD	29.4 ± 6.7	26.7 ± 6.8	0.13
Mean CVLT-II ± SD	71.9 ± 3.0	68.6 ± 4.3	0.001*
Mean BVMT-R ± SD	35.6 ± 1.0	34.1 ± 2.7	0.01*

***Note*:** PSQI: Pittsburgh Sleep Quality Index, SDMT: Symbol Digit Modalities Test, CVLT-II: California Verbal Learning Test-2nd Edition, BVMT-R: Brief Visuospatial Memory Test Revised, SD: Standard Deviation, 1Student's t-test, *p<0.05

Table 3

Results of the Linear Mixed-Effects Models with Random Intercepts for the Rates of Outcome Change (N=60)

Characteristic	b for group ± SE	p value	b for time ± SE	p value	b for group × time interaction with SMTI group as a reference[1] ±SE	p value
BMI (Kg/m2)	-1.5 ± 1.0	0.13	-0.6± 0.1	0.001*	0.5 ± 0.2	0.02*
HLPCQ	-3.1 ± 3.2	0.33	15.5 ± 2.6	0.001*	-2.3 ±3.7	0.54
Stress	2.6 ± 1.1	0.02*	-2.4 ± 1.0	0.02*	-1.5 ±1.4	0.30
Anxiety	2.4 ± 0.9	0.01*	-1.4 ± 0.9	0.11	-2.1 ±1.2	0.09
Depression	1.1 ± 0.9	0.20	3.1 ± 0.9	0.001*	-1.1 ±1.2	0.39
Anger In	0.1 ± 1.1	0.93	-0.1± 0.7	0.86	-4.9 ±1.0	<0.001*
Anger Control	-1.7 ± 1.2	0.15	0.2 ± 0.9	0.85	7.4 ± 1.3	<0.001*
Emotional Intelligence	3.6 ± 3.2	0.26	17.2 ± 3.6	<0.001*	-1.7 ±3.7	0.65
Self-Efficacy	0.0 ± 1.5	1.0	6.1 ± 1.3	<0.001*	2.6 ± 1.9	0.18

Coherence	-2.9 ± 2.8	0.32	14.5 ± 2.7	<0.001*	9.0 ± 3.7	0.02*

***Note*:** BMI: Body Mass Index, HLPCQ: Healthy Lifestyle and Personal Control Questionnaire, SE: Standard Error

[1]Reference categories: both stress management group and baseline time were coded as zeros in the model, thus b represents the mean rate of outcome change for the Pythagorean Self-Awareness group.

*p<0.05

Table 4

Results of the Linear Mixed-Effects Models with Random Intercepts for the Rates of Outcome Change (N=60)

Characteristic	**b for group ± SE**	**p value**	**b for time ± SE**	**p value**	**b for group × time interaction with SMTI group as a reference[1] ±SE**	**p value**
Physical Fatigue (mm)	-1.0 ± 0.6	0.09	-1.9 ±0.5	<0.001*	-0.6 ± 0.7	0.42
Cognitive Fatigue (mm)	-0.6 ± 1.5	0.68	0.0 ± 1.3	0.98	-4.6 ± 1.8	0.01*
Mental Fatigue (mm)	-1.6 ± 2.4	0.24	-10.9±1.1	<0.001*	-2.4 ± 1.6	0.14

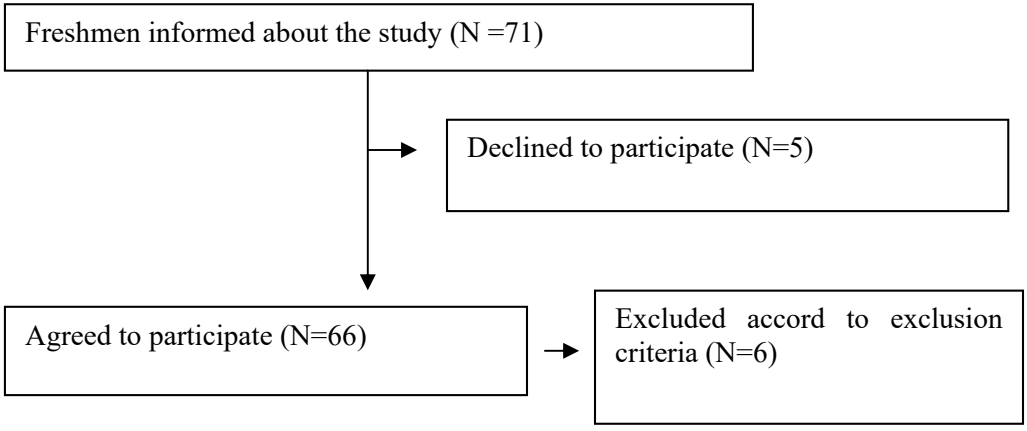
PSQI	0.8 ± 0.7	0.25	-0.9 ±0.6	0.14	-1.3 ± 0.8	0.12
SDMT	2.7 ± 2.2	0.22	29.4 ±1.7	<0.001*	14.9 ± 2.4	<0.001*
CVLT-II	3.2 ± 0.8	<0.001*	6.4 ± 0.5	<0.001*	-0.4 ± 0.6	0.60
BVMT-R	1.5 ± 0.4	<0.001*	1.7 ± 0.3	<0.001*	-1.5 ± 0.5	0.02*

Note*:* PSQI: Pittsburgh Sleep Quality Index, SDMT: Symbol Digit Modalities Test, CVLT-II: California Verbal Learning Test-2nd Edition, BVMT-R: Brief Visuospatial Memory Test Revised, SD: Standard Deviation, SE: Standard Error

[1]Reference categories: both stress management group and baseline time were coded as zeros in the model, thus b represents the mean rate of outcome change for the Pythagorean Self-Awareness group.

*p<0.05

Figures



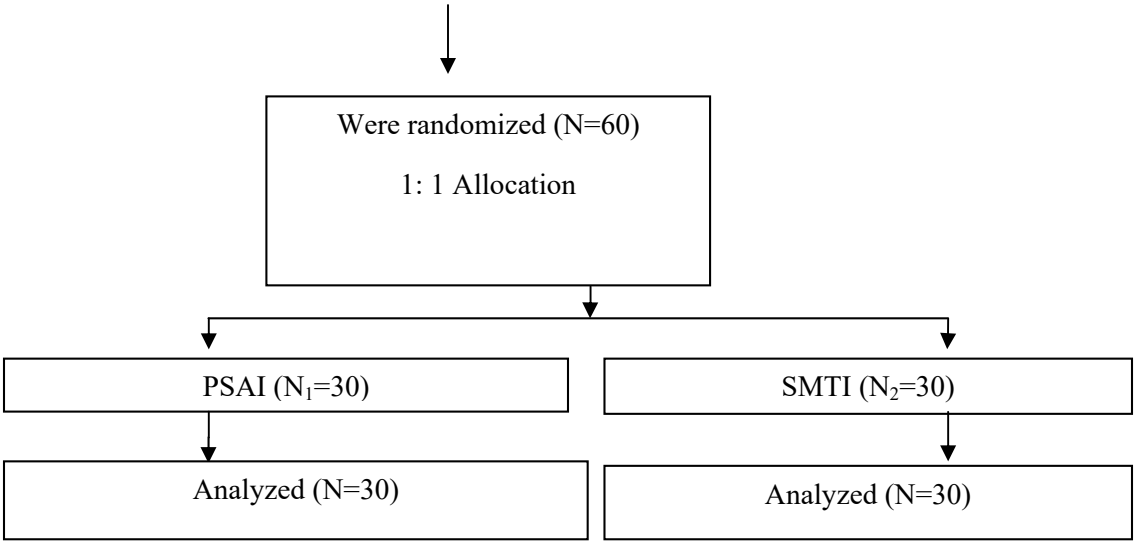


Figure 1. Flowchart of study participants

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