

RESEARCH OF INNOVATION TECHNIQUES FOR REDUCING STRESS AND ANXIETY WITH MOBILE APPLICATIONS FOR MEDITATION

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In conditions of "accelerate" the pace of life and increasing the flow of information in the modern world 78% of people regularly experience physical symptoms caused by stress, which is in 48% of the respondents have a negative effect on work and everyday life. The annual costs of employers in the United States related to the provision of health care and missed work in case of stress, to 300 bn. Dollars [1]. From 1999 to 2012 the percentage of Americans who take antidepressants increased from 6.8% to 13%, according to the report Journal of the American Medical Association (JAMA) (2015). The newspaper The New York Times calls the generation of Americans aged 18 to 29 years old – The Antidepressant Generation. Self-help problem can be solved through the creation of mobile applications to control stress levels, especially in the modern Smartphone society.

The advent of applications Just-in-Time Adaptive Interventions (further – JITAIs) [2], allows user at any time to monitor its psycho-emotional and physical condition, and have mediated phone self-help. JITAIs the most popular applications for stress management based on the principles of cognitive-behavioral therapy.

Application developers take as a basis the practice of meditation in psychotherapy and prophylactic purposes or put emphasis on the development of private breathing techniques, because meditation practices showing sufficiently high efficiency in reducing stress [3].

One of the examples of the JITAIs applications for stress control are: Calm; Headspace; Aura; Stop, Breathe & Think; Deep Relax; Flowy and Serenita. These applications allow user to select from a predetermined stimulus material (pictures, video, and audio) in order to arrange a soothing meditative practice, breathing control is the basis of such practice, and observed images on the phone screen making auxiliary breathing techniques function.

We can **highlight problems of traditional meditation practice that can solve with the JITAIs application:**

1. New JITAIs meditation followers evade the problem of **choosing "guru" and the availability of assistance at any time** by creating software with the universal protocols.
2. JITAIs applications help partially to solve the problem of need for a **special room for meditation** and negative social attitudes, because the focus on mobile phone screen is more socially acceptable than the concentration at any point in space.
3. To mastering a number of techniques of meditation it is necessary **to be able to visualize given image**. At the same time, according to research aphantasia phenomenon 2.1 – 2.7% of the sample generally cannot imagine a visual image in the mind [4]. The demonstration finished visual images, accompanied by audio recordings, helps members of the group to remove the need of mental visualization and to go with meditation "open eyes" when you have finished visual stimuli, as in the type of applications Calm and focus on audio instructions in applications such as Headspace.

However, remain unsolved problems, which lead to the reduction or absence of positive effects, both from traditional and from JITAIs meditation.

Along with the presentation and focus on images that are solved with the help of their demonstration on the screen, meditation techniques involve focusing on the sensations in one's body and current emotional state. In turn, psychological trauma may involve coping mechanisms of blocking emotions (secondary alexithymia) [5]. Complaints of such patients are general negative emotions, without specifying them, and in the future this situation may lead to stress and somatization disorders. This inability to track and specify their emotional state, present emotional feelings in certain parts of the body makes it difficult to start meditation practices and can lead to disappointment in their effectiveness.

An alternative to meditative techniques is use of biofeedback (further – BFB) and audio-visual stimulation (further – AVS).

BFB systems allow diagnosis and treatment through analysis of biomarkers of stress by non-invasive methods. This allows people to get a secondary positive effect of alexithymia without verbalization / visualization of complaints and track the state changes in the future. The effectiveness of biofeedback training is equal to the effectiveness of meditation and daily exercise to reduce stress levels, and positive self-image [6].

AVS systems are based on stimulation of the central nervous system with certain visual and audio signals. These are different sets of sound rows, reproduced through the audio device, and light (color) signals, which are displayed with an image (screen, monitor the LED panel or mask) [7].

However, existing protocols for BFB and AVS suggest the presence of special equipment (registration sensor, LED glasses / mask), tracking changes on the screen. The emergence of new applications based on the principles of biofeedback can solve the problem of diagnostics for greater individualization of programs.

An example of such JITAI's application, based on the principles of biofeedback is Serenita application and Biobeats which are diagnosing stress condition by means of a smartphone camera becoming a biometric sensor, and further assess the level of user stress. However, the further practice of stress management in these applications also comes down to mastering of breathing techniques.

Conclusions:

1. JITAIs applications for reducing stress can solve the problem with the choice of a mentor, special room for meditation and visualization of pre-given image in conditions of aphantasia by audio instructions and display visual images on your mobile phone for the user.
2. There were analyzed the problems which are remaining unsolved for JITAIs meditation applications. This is identification of the actual psycho-emotional state and arbitrary imaging somatic sensations in the case of secondary alexithymia and problems at individualization diagnostic monitoring and future programs.
3. We considered alternative methods for reducing stress, based on the principles of BFB and AVS, which allow individualize diagnostics and JITAIs application program for reducing stress.

In the future, promisingly are study the effectiveness of the JITAIs applications for relieving stress and develop of applications based on alternative methods of meditation psychotherapeutic care under stress, BFB and AVS.

References

1. Statistic Brain Research Institute, American Institute of Stress, NY <http://www.statisticbrain.com/stress-statistics/>
2. Nahum-Shani S. Just-intime adaptive interventions (JITAI)s: An organizing framework for ongoing health behavior support / S. Nahum-Shani, S. N. Smith, A. Tewari, et al. // Technical Report №14-126. University Park, PA: The Methodology Center, Penn State. – 2014
3. G. Desbordes, Lobsang T. Negi, Thaddeus W. W. et al. Effects of mindful-attention and compassion meditation training on amygdala response to emotional stimuli in an ordinary, non-meditative state 2012; 6: 292.
4. Zeman A. Lives without imagery: Congenital aphantasia / A. Zeman, M. Dewar, S. Della Sala // Cortex. – 2015. – №73. – P. 378-380.

5. J. van der Velde, P. M. Gromann, M. Swart, D. et al. Alexithymia influences brain activation during emotion perception but not regulation. *Psychother Psychosom.* 2006;75(5):304-11.

6. de Bruin EI, van der Zwan JE, Bögels SM. A RCT Comparing Daily Mindfulness Meditations, Biofeedback Exercises, and Daily Physical Exercise on Attention Control, Executive Functioning, Mindful Awareness, Self-Compassion, and Worrying in Stressed Young Adults. *Mindfulness (N Y).* 2016;7(5):1182-1192.

7. Introduction to Audio-Visual Stimulation (AVS)

<https://www.mindfield.de/en/AVS/Introduction-to-Audio-Visual-Stimulation-AVS.html>