Cureus

Open Access
Abstract
Published 04/25/2023

Copyright
© Copyright 2023
Sansalone. This is an open access abstract distributed under the terms of the Creative Commons Attribution License CC-BY 4.0., which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Distributed under
Creative Commons CC-BY 4.0

Mind Music: A Serious Game for Tourette Syndrome

Stevie C. Sansalone [1]

1. Computer Science, Ontario Tech University, Oshawa, CAN

Corresponding author: Stevie C. Sansalone, stevie.sansalone@ontariotechu.ca

Categories: Neurology, Psychology, Therapeutics
Keywords: serious gaming, tourette's syndrome

How to cite this abstract
Sansalone S C (April 25, 2023) Mind Music: A Serious Game for Tourette Syndrome. Cureus 15(4): a968

Abstract

Background: Tourette Syndrome (TS) is a neurological condition which causes repetitive semi-voluntary motor and vocal actions known as tics and affects approximately 0.77% of Canadians [1]. While a variety of treatment options have been explored for TS, serious games have not yet been explored for treating TS despite their success in treating TS-comorbid conditions attention-deficit/hyperactivity disorder (ADHD) [2] and obsessive-compulsive disorder (OCD) [3].

Objective: This research seeks to investigate the use of serious games for treating TS in conjunction with habit reversal therapy (HRT), a frequently used therapeutic treatment, which, while effective, can be uncomfortable to begin as it requires actively suppressing tics [4]. This work will attempt to address this discomfort using a serious game.

Description of Innovation: This work proposes the development of a serious game called Mind Music which will be designed to facilitate progression through each of the steps of HRT [5]. Given that creative activities involving music have been shown to reduce tics, Mind Music will seek to alleviate discomfort around beginning HRT by pairing therapeutic techniques with a music-based game. To accomplish this, Mind Music will allow users to catalogue their tics, the competing actions they have chosen for treatment, and then practice sessions of HRT with a rhythm game to reduce the discomfort of suppressing tics.

Impact: Should Mind Music prove effective; it will reduce discomfort around HRT and represent a step towards diversifying treatment options for individuals with TS. Mind Music will be designed first for adolescents with TS in conjunction with advice from experts and members of the community, but future work shall focus on adapting Mind Music for use with adults. Full use of Mind Music will require a mobile device, a computer, and an Xbox Kinect, but some features of the game will be usable with only a mobile device to ensure it reaches as many users as possible.

References:

[1] J. Yang, L. Hirsch, D. Martino, N. Jette, J. Roberts, and T. Pringsheim, “The prevalence of diagnosed tourette syndrome in canada: A national population-based study,” Movement Disorders, vol. 31, pp. 1658–1663, Aug. 2016.

[2] K. C. Bul, P. M. Kato, S. Van der Oord, M. Danckaerts, L. J. Vreeke, A. Willems, H. J. van Oers, R. Van Den Heuvel, D. Birnie, T. A. Van Amelsvoort, I. H. Franken, and A. Maras, “Behavioral outcome effects of serious gaming as an adjunct to treatment for children with attention-deficit/hyperactivity disorder: A randomized controlled trial,” J Med Internet Res, vol. 18, p. e26, Feb 2016.

[3] H. Hwang, S. Bae, J. S. Hong, and D. H. Han, “Comparing effectiveness between a mobile app program and traditional cognitive behavior therapy in obsessive-compulsive disorder: Evaluation study,” JMIR Ment Health, vol. 8, p. e23778, Jan 2021.

[4] H. P. Sigurdsson, S. E. P´ep´es, G. M. Jackson, A. Draper, P. S. Morgan, and S. R. Jackson, “Alterations in the microstructure of white matter in children and adolescents with tourette syndrome measured using tractbased spatial statistics and probabilistic tractography,” Cortex, vol. 104, pp. 75–89, July 2018.

[5] E. Misirlisoy, V. Brandt, C. Ganos, J. T¨ubing, A. M¨unchau, and P. Haggard, “The relation between attention and tic generation in tourette syndrome,” Neuropsychology, vol. 29, no. 4, 2015.