



Influence of auriculotherapy on cognition and memory in adolescents

Matias Noll^{1,2}, Carolina Rodrigues Mendonça², Priscilla Rayanne e Silva Noll^{1,3}, Erika Aparecida Silveira²

¹Instituto Federal Goiano (IF Goiano), Goiás, Brazil; ²Departamento de Clínica Médica, Faculdade de Medicina, Universidade Federal de Goiás (UFG), Goiás, Brazil; ³Departamento de Obstetrícia e Ginecologia, Faculdade de Medicina (FMUSP), Universidade de São Paulo, São Paulo, SP, Brazil

Correspondence to: Matias Noll. Rua 17, Qd 53, Lt 10A, Centro, Rialma, GO, Brazil. Email: matias.noll@ifgoiano.edu.br.

Submitted Nov 23, 2019. Accepted for publication Dec 12, 2019.

doi: 10.21037/tp.2020.03.10

View this article at: <http://dx.doi.org/10.21037/tp.2020.03.10>

Introduction

Learning disorders affect more than 10% of adolescent students (1). Many youths with learning disorders experience frustration in school as they struggle to complete complex assignments. Learning disorders are common throughout the developmental period (2); however, most diagnostics in medical and psychological practice are inconsistent (1). This has led to an increasing interest in complementary and alternative therapies (3), such as acupuncture, chiropractic therapy, and massage therapy (4).

From complementary and integrative health approaches, auriculotherapy has been practiced as a therapeutic intervention for a long time in the Chinese population and has recently gained recognition and is now increasingly being practiced worldwide. Clarke *et al.* (5) estimated the use of complementary health approaches among adults in the United States at three time points [2002, 2007, and 2012] and found a spike in the use of Chinese complementary and integrative medicine. Its application is expanding in the primary health care sector (6), for the treatment of chronic and acute pain, temporomandibular dysfunction, weight reduction, and smoking cessation (7,8). Given that auriculotherapy is a safe, simple, and low-cost technique (9), it is being used to treat a wide variety of conditions (7).

The efficacy and safety of auriculotherapy in older patients with cognitive impairment and dementia have been previously analyzed. However, the results were inconclusive due to the small sample size and poor methodology of the included studies (10). The effects of auriculotherapy on learning, cognition, and memory are scarce, especially in

adolescents (10). To address this gap, our research aims to answer the following question: Could auriculotherapy improve cognition and memory in adolescents? To answer this research question, we performed a systematic review to analyze the influence of auriculotherapy on cognition and memory in adolescents.

What do we know about the influence of auriculotherapy on cognition and memory in adolescents?

For the review, the eligibility criteria were specified according to the Population, Intervention, Comparison, Outcome (PICO) structure, which is explained in the recommended notification items for systematic reviews. Accordingly, “P” represented adolescent, “I” represented the use of auriculotherapy, “C” represented the use of other therapies or placebo, and “O” represented cognition and memory variables. Observational studies and clinical trials with no language restrictions were included. No restrictions in terms of the year of publication were imposed. Studies with incomplete data and review articles were excluded.

We used four databases (SCOPUS, PubMed, Science Direct, and Embase) for our search. The following combinations of keywords (I) “(((auriculotherapy[MeSH Terms]) OR auricular acupuncture[Title/Abstract])) AND (((((Memory[MeSH Terms]) OR Learning[MeSH Terms]) OR mental processes[MeSH Terms]) OR Cognitive Function[MeSH Terms]) OR cognition[MeSH Terms])” were used in PubMed; (II) “TITLE-ABS-KEY(auriculotherapy OR “auricular acupuncture”) AND

TITLE-ABS-KEY(Memory OR Learning OR “mental processes” OR “Cognitive Function” OR cognition)” in Scopus; (III) “(auriculotherapy OR “auricular acupuncture”) AND (Memory OR Learning OR “mental processes” OR “Cognitive Function” OR cognition)” in Science Direct; and (IV) “(auriculotherapy:ti,ab,kw OR 'auricular acupuncture':ti,ab,kw) AND (memory:ti,ab,kw OR 'mental function':ti,ab,kw OR 'cognitive function':ti,ab,kw OR cognition:ti,ab,kw OR learning:ti,ab,kw)” in Embase. We have performed the search on 30 October 2019.

A total of 46 eligible studies were identified (PubMed, 17 studies; Scopus, 16 studies; Science Direct, 2 studies; Embase, 11 studies). We analyzed both titles and abstracts to decide if the study could be included in our systematic review. However, none of the articles met our criteria. After reading the full articles, all studies were excluded because they were experimental animal studies or did not study adolescent populations. This lack in the review results highlights the need for further epidemiological research focusing on this topic, including high quality, large scale, and observational studies as well randomized controlled trials to confirm or refute efficacy.

Understanding the effects of auriculotherapy on cognition and memory is important because it will help daily practitioners in the field of education and health. Randomized controlled trials with adequate sample sizes and well-conducted standard intervention protocols will provide empirical evidence to support the use of auriculotherapy as an effective complementary and alternative therapy for treating cognitive and memory conditions in adolescents.

Acknowledgments

To the Instituto Federal Goiano [ifgoiano.edu.br] and the Fundação de Amparo à Pesquisa do Estado de Goiás (FAPEG) [www.fapeg.go.gov.br] for the support.

Funding: None.

Footnote

Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at <http://dx.doi.org/10.21037/tp.2020.03.10>). The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related

to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Open Access Statement: This is an Open Access article distributed in accordance with the Creative Commons Attribution-NonCommercial-NoDerivs 4.0 International License (CC BY-NC-ND 4.0), which permits the non-commercial replication and distribution of the article with the strict proviso that no changes or edits are made and the original work is properly cited (including links to both the formal publication through the relevant DOI and the license). See: <https://creativecommons.org/licenses/by-nc-nd/4.0/>.

References

1. Galuschka K, Schulte-Körne G. The Diagnosis and Treatment of Reading and/or Spelling Disorders in Children and Adolescents. *Dtsch Arztebl Int* 2016;113:279-86.
2. Ascherman LI, Shaftel J. Facilitating Transition from High School and Special Education to Adult Life: Focus on Youth with Learning Disorders, Attention-Deficit/Hyperactivity Disorder, and Speech/Language Impairments. *Child Adolesc Psychiatr Clin N Am* 2017;26:311-27.
3. Li S, Yu B, Zhou D, et al. Acupuncture for Attention Deficit Hyperactivity Disorder (ADHD) in children and adolescents. *Cochrane Database Syst Rev* 2011;(4):CD007839.
4. Nahin RL, Boineau R, Khalsa PS, et al. Evidence-Based Evaluation of Complementary Health Approaches for Pain Management in the United States. *Mayo Clin Proc* 2016;91:1292-306.
5. Clarke TC, Black LI, Stussman BJ, et al. Trends in the use of complementary health approaches among adults: United States, 2002-2012. *Natl Health Stat Report* 2015;(79):1-16.
6. Tesser CD, Moré AOO, Santos MC, et al. Auriculotherapy in primary health care: A large-scale educational experience in Brazil. *J Integr Med* 2019;17:302-9.
7. Vieira A, Reis AM, Matos LC, et al. Does auriculotherapy have therapeutic effectiveness? An overview of systematic reviews. *Complement Ther Clin Pract* 2018;33:61-70.
8. Mendonça CR, Coelho Dos Santos LS, Noll M, et al. Effects of auriculotherapy on weight and body mass index reduction in patients with overweight or obesity: Systematic review and meta-analysis. *Complement Ther Clin Pract* 2020;38:101069.
9. Zhu L, Kim Y, Yang Z. The Application of

- Auriculotherapy to the Treatment of Chronic Spontaneous Urticaria: A Systematic Review and Meta-analysis. *J Acupunct Meridian Stud* 2018;11:343-54.
10. Kwon CY, Lee B, Suh HW, Chung SY, Kim JW. Efficacy

and Safety of Auricular Acupuncture for Cognitive Impairment and Dementia: A Systematic Review. *Evid Based Complement Alternat Med* 2018;2018:3426078.

Cite this article as: Noll M, Mendonça CR, Noll PRES, Silveira EA. Influence of auriculotherapy on cognition and memory in adolescents. *Transl Pediatr* 2020;9(2):195-197. doi: 10.21037/tp.2020.03.10