EXAMINING LINKAGES OF ADHD RISK ALLELE DOPAMINE TRANSPORTER GENE DAT1: A BIBLIOMETRIC ANALYSIS OF THE TOP 100 MOST-CITED ARTICLES OF EXISTING LITERATURE ON ADHD DEVELOPMENT & RISK FACTORS

Think Neuro & UC Berkeley

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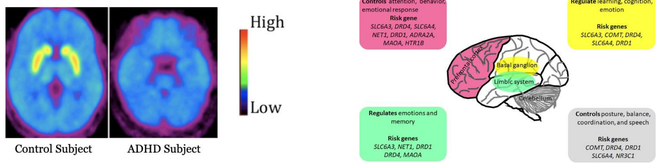
INTRODUCTION

Attention deficit hyperactivity disorder (ADHD) is a common neurobehavioral disorder that afflicts 5% of children and adolescents around the globe, resulting in functional impairments, such as inattentiveness and impulsivity that can span into adulthood. ADHD can be caused by a variety of genetic and environmental factors, such as dopamine dysregulation[1] and has been linked to the dopamine transporter gene DAT1 that works to reuptake dopamine from the synapse leaving low dopamine levels in the brain. DAT1/SLC6A3 is one of many risk genes that has been studied in relation to polymorphism in the promoter region of the gene[2]. As a risk gene, DAT1 variability is associated with altered brain regions like the prefrontal cortex and cerebellum and this genetic variation may contribute to many of the commons symptoms of ADHD.

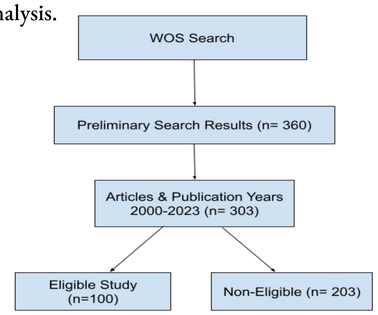


OBJECTIVES

This study aimed to analyze and apply the characteristics of the 100 most-cited articles on the association between the dopamine transporter (DAT1) gene and ADHD in order to discover inherent patterns within existing literature and highlight potential areas of future development in this area of study. Our goal was to provide insight into the correlation between ADHD prevalence and DAT1, understand how variability of the DAT1 gene region impacts development of ADHD and affects how dopamine blockers can treat ADHD, and spotlight existing research on the relationship between ADHD with DAT1 to encourage future studies on their linkage in the scientific community.

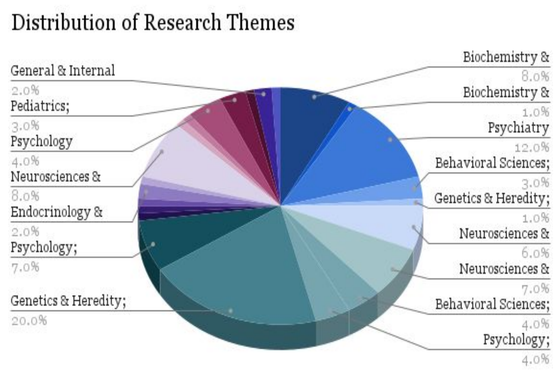
METHODS

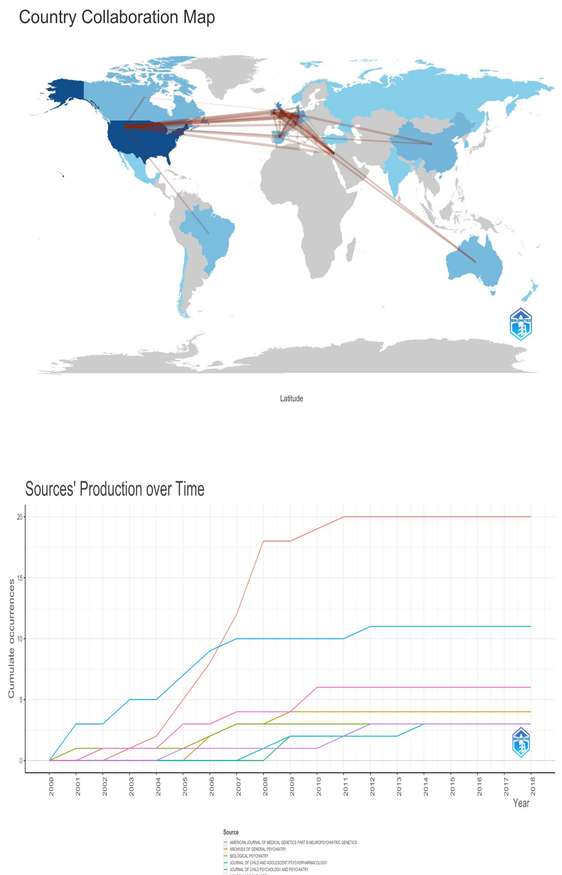
The Web of Science (WoS) Core Collection Database was utilized to perform a literature search on the most relevant articles regarding ADHD and the DAT1 gene. The primary search yielded 303 articles which were further sorted based on relevance and citation quantity and manually reviewed to curate the top 100 most-cited articles for bibliometric analysis.

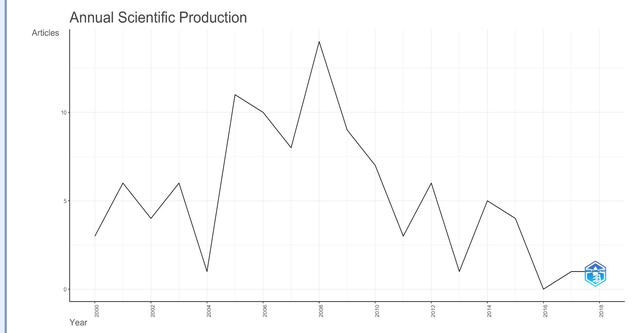


Inclusion criteria were as follows: (a) centers on linkage/association with ADHD and DAT1; (b) association determinable from study. Exclusion criteria: (a) did not find linkage; (b) ADHD was not primary focus of genetic analysis.

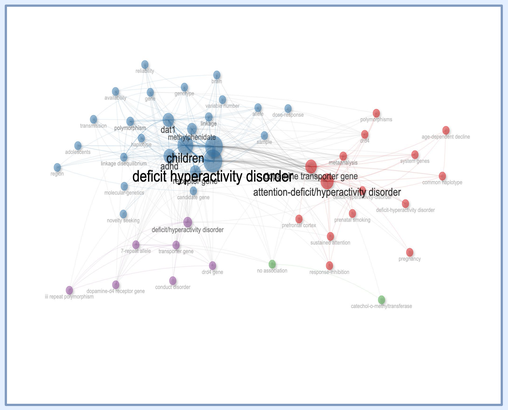
RESULTS & DISCUSSION







The top cited articles on ADHD and DAT1 were published between the years of 2000 and 2018, with the total number of citations being 7,431 and the most productive year being 2008. The United States was the top contributing country at 31 published articles, followed closely by the United Kingdom. 15 authors demonstrated substantial productivity by publishing 2 or more articles each, notably Faraone SV, Franke B, and Gill M, who each authored 10 documents. The overarching theme was "Genetics and Heredity" at 20% of the overall themes distribution, and the top journals of publication included the *American Journal of Medical Genetics*, accounting for 22% of the articles, and *Molecular Psychiatry* for 11%. 50 unique author keywords were extracted and 8 keywords repeated at least 10 times, with the most frequent words being "ADHD", "attention deficit hyperactivity disorder" (*n=50*), and "dat1" (*n=36*), suggesting an increased interest in the field of research. The annual scientific production peaked in 2008 and began to decline in the past few years. However, ADHD genetic research remains incredibly important with regards to uncovering interactions between genetic variability and medications that target genes such as DAT1. It is evident that the risk factor field within ADHD research is still growing and requires further study.



CONCLUSION

Based on our conduction of bibliometric analyses and interpretation of the statistical data, we conclude that the role of the dopamine transporter gene (DAT1) in ADHD persists as an understudied area, and that these areas would benefit greatly from further in depth exploration. From the figures, we derived that common themes and patterns found within current research involve ADHD response inhibition, prenatal smoking, and 3'-UTR VNTR differential susceptibility. Our research demonstrates a clear upwards trend in the study of ADHD, specifically in terms of genetic risk factors and alleles such as abnormal dopamine levels in affected patients. Thus, it is crucial that this niche continue to be pursued in order to glean a stronger understanding of what causes ADHD and potentially make strides towards developing an effective drug therapy that will revolutionize the lives of children and adolescents globally.

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