

Tic Severity Moderators in Tourette's Syndrome

An Evidence-Based Review of Tic Severity Moderators and their Effects in Tourette's Syndrome



Francesca Conti BSc¹, Himanshu Tyagi MRCPsych^{2, 3}

1. UCL, Division of Psychiatry; 2. Department of Clinical and Movement Neuroscience, UCL Queen Square Institute of Neurology; 3. National Tourette Syndrome Outpatient Clinic for Adults, National Hospital for Neurology and Neurosurgery, Queen Square, London.

Introduction

Tic severity

- **Tic severity** may be defined as variations in the intensity or frequency of tics (Storch et al., 2011).
- Tics severity can vary widely and can cause significant psychosocial, physical and functional distress and difficulties (Efron & Dale, 2018).
- Changes in the severity of tics in TS can be **moderated** by a variety of independent simple or complex factors such as external or internal stimuli overlaid with psychological and physiological variables.
- Identifying such moderators also has important clinical implications as it can aid clinicians in adjusting interventions.

Tourette Syndrome

- **Tourette Syndrome** (TS) is a neurodevelopmental disorder characterised by multiple motor and vocal tics (Groth, Skov, Lange & Debes, 2019).
- A **tic** is a sudden, recurrent, nonrhythmic, involuntary motor movement or vocalization.
- These can be simple (e.g. eye blinking, coughing, sniffing) or complex in nature (e.g. jumping, copropraxia, echolalia, coprolalia; Singer, 2019).
- Since the last complete review of known moderators in 2008 (Conelea & Woods, 2008), new research has been conducted showing how moderators may contribute to improving or worsening the severity of tics (Caurin et al., 2014; Himle et al., 2014).

The National Tourette Syndrome Outpatient Clinic for Adults, NHNN, London.

- Offers assessment, advice and treatment to patients with a suspected or confirmed diagnosis of TS.



Aims

1. To review evidence-based literature related to tic-severity moderators and their tic-worsening, tic-improving and neutral effects in individuals with TS.

Method

- A literature search using terms relating to tic severity, tic frequency, factors and moderators was conducted on Ovid Medline, PsychInfo, APA PsychArticles, ProQuest, Scopus and PubMed following PRISMA guidelines (see Figure 1).
- The criteria for this review included any published study, review and meta-analysis after 2008, that investigated the effect of external and/or internal factors on tic severity in TS, either as primary or secondary outcomes.
- Tic severity was mostly measured using the Yale Global Tic Severity Scale (YGTSS; Leckman et al., 1989) or via directly counting tic frequency or other relevant, validated measures.
- No restrictions on age or comorbidities were put for participants. This study included children, adolescents and adults with TS both and without comorbidities.
- Reference lists of previous and relevant reviews and meta-analyses were also screened.
- The identified moderators were all collected in Excel and were then coded into themes via a semantic thematic analysis approach (Braun & Clarke, 2006).
- The generated themes were based on appropriate and relevant MeSH terms.

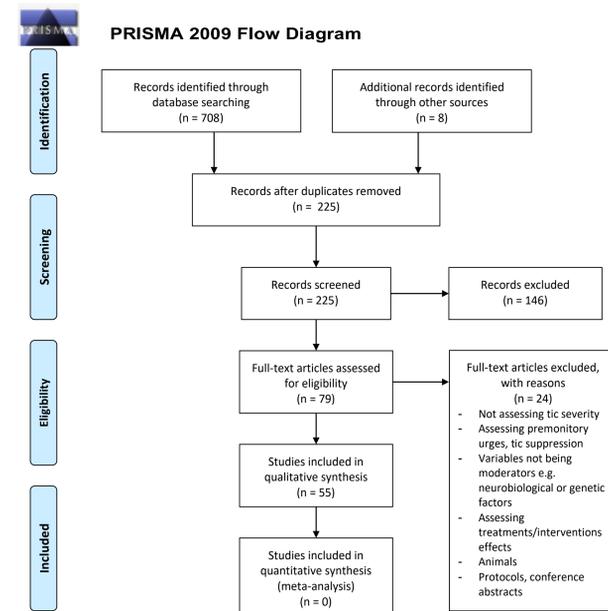


Figure 1. PRISMA Flowchart of included studies.

Results

- 73 tic severity moderators were identified based on new research after 2008.
- The most common were exercise, sleep, bullying, psychosocial stress, watching TV, academic activities and distraction.
- 29 themes based on related MeSH terms were developed, these being:

- Exercise
- Physical Fitness
- Sedentary Behaviour
- Hobbies
- Academic Performance
- Academic Success
- Life Change Events
- Anniversaries and Special Events
- Fatigue
- Boredom
- Multitasking Behaviour
- Automatism
- Frustration
- Relaxation
- Stress, Psychological
- Emotion Regulation
- Sleep Deprivation
- Attention
- Attentional Bias
- Social Stigma
- Social Isolation
- Interpersonal Relations
- Environment
- Holidays
- Diet
- Environmental Illness
- Recreational Drug Use
- Substance-Related Disorders
- Comorbidity

- A high variability in the effects of tic severity moderators was found.
- Most research views these moderators' effects in a dichotomous way: either worsening or improving. However, this was not seen in this review.
- It was noted that some moderators can be tic-worsening in some individuals and tic-improving or even neutral in others, highlighting the subjectivity of these effects on tic severity.

Conclusion

- As previous research has looked at the effects of moderators in a dichotomous way, clinicians and researchers should be made more aware of the existence and variability of these tic severity moderators and of their highly subjective effects.
- Shifting attention to moderators in order to reduce tic severity also has important, direct implications for the assessment and management of tics.
- The current assessment of tic severity moderators is driven by a clinical interview. Based on this review, a Moderators Inventory will be developed in order to efficiently identify personal tic severity moderators and their effects in individuals with TS.
- This review therefore invites future research and clinicians to take a more holistic, three-dimensional approach on the moderators' effects on tic severity into consideration.

References

- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research In Psychology*, 3(2), 77-101. doi: 10.1191/1478088706qp063oa
- Caurin, B., Serrano, M., Fernández-Alvarez, E., Campistol, J., & Pérez-Dueñas, B. (2014). Environmental circumstances influencing tic expression in children. *European Journal Of Paediatric Neurology*, 18(2), 157-162. doi: 10.1016/j.ejpn.2013.10.002
- Conelea, C., & Woods, D. (2008). The influence of contextual factors on tic expression in Tourette's syndrome: A review. *Journal Of Psychosomatic Research*, 65(5), 487-496. doi: 10.1016/j.jpsychores.2008.04.010
- Efron, D., & Dale, R. (2018). Tics and Tourette syndrome. *Journal Of Paediatrics And Child Health*, 54(10), 1148-1153. doi: 10.1111/jpc.14165
- Groth, C., Skov, L., Lange, T., & Debes, N. (2019). Predictors of the Clinical Course of Tourette Syndrome: A Longitudinal Study. *Journal Of Child Neurology*, 34(14), 913-921. doi: 10.1177/0883073819867245
- Himle, M., Capriotti, M., Hayes, L., Ramanujam, K., Scahill, L., & Sukhodolsky, D. et al. (2014). Variables Associated With Tic Exacerbation in Children With Chronic Tic Disorders. *Behavior Modification*, 38(2), 163-183. doi: 10.1177/0145445514531016
- Leckman, J., Riddle, M., Hardin, M., Ort, S., Swartz, K., Stevenson, J., & Cohen, D. (1989). The Yale Global Tic Severity Scale: Initial Testing of a Clinician-Rated Scale of Tic Severity. *Journal Of The American Academy Of Child & Adolescent Psychiatry*, 28(4), 566-573. doi: 10.1097/00004583-198907000-00015
- Singer, H. (2019). Tics and Tourette Syndrome. *CONTINUUM: Lifelong Learning In Neurology*, 25(4), 936-958. doi: 10.1212/con.0000000000000752
- Storch, E., De Nadai, A., Lewin, A., McGuire, J., Jones, A., & Mutch, P. et al. (2011). Defining Treatment Response in Pediatric Tic Disorders: A Signal Detection Analysis of the Yale Global Tic Severity Scale. *Journal Of Child And Adolescent Psychopharmacology*, 21(6), 621-627. doi: 10.1089/cap.2010.0149



@ContiF_

francesca.conti.20@ucl.ac.uk



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London Hospitals
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