

**#3118 Title: Tic-severity moderators: a systematic review on the subjectivity of external and internal factors in moderating tic-severity in Tourette's Syndrome.**

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**Objectives:**

Changes in the severity of tics in Tourette's syndrome (TS), as seen with variations in the intensity or frequency of tics, 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 has important clinical implications as it can aid clinicians in adjusting interventions. Here we review research literature related to tic-severity moderators and their tic-worsening, tic-improving and neutral effects in individuals with TS with the aim to create a clinical inventory of moderating variables.

**Methods:**

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. The criteria for this review included any published study, review and meta-analysis after the last review in 2008, investigating external and internal factors that had a tic-worsening, improving or neutral effect on children, adolescents or adults with TS and comorbidities.

**Results:**

225 studies were initially identified after deduplication. A variety of tic severity moderators were identified with the most prominent being the effects of exercise, sleep, distraction and comorbidities such as ADHD. However, an interesting finding was the high variability in these tic-moderating effects, as the same factor was tic-worsening in some patients and tic-improving in others, highlighting the subjectivity of these effects on tic severity. It was also noted that most of the reviewed research did not report the possibility of a neutral effect.

**Conclusions:**

As previous research has looked at these 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. This also has important, direct implications for the psychological assessment and treatment of tics. This review invites future research and clinicians to take this holistic approach on the effects on tic severity into consideration.