



Functional movement disorders triggered by reality shifting and the Backrooms—another social media traps

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Dear Sirs,

Until recently, functional tics represented only a minority of functional movement disorders (FMD). However, during the COVID-19 pandemic, an increasing number of cases with new types of tic-like behaviors (often called TikTok tics) rapidly spreading worldwide among many young people via social media (e.g., TikTok) were reported [1–3]. We provide the case of a young girl suffering from functional tics and tremor associated with the intense use of TikTok, as well as reality shifting (RS) and the backrooms.

A 15-year-old girl recently diagnosed with depression was recommended to our Movement Disorders Treatment Center due to an 8-month history of various abrupt onset complex motor tics followed by complex vocal tics emerging as numerous repetitive phrases, whistling and squealing. She repeated different sounds and phrases heard on social media. The phrases were in English; they were often very long and repeated with the same intonation as they had been heard. Coprolalia was also present. Tics were anticipated by unspecific premonitory sensations and were sometimes triggered by loud noises or emotional stress. Moreover, the patient suffered from self-injurious behavior (e.g., repetitive punching of the wrists, stabbing her hand with a pen or a fork). Except for dyslexia and dysgraphia diagnosed at a younger age, the patient had no history of any medical condition. There was also no previous history of tics during

childhood. The family history was insignificant. Brain MRI and standard laboratory tests did not reveal any abnormality. The titers of anti-streptolysin O and anti-DNAse B were within the normal range.

The initial diagnosis of atypical Tourette syndrome was later replaced by TikTok tics (abrupt onset, adolescent age, possible association with the social media use). Subsequently, we conducted an extensive interview with the patient and her mother, and several interesting points about the patient's personality and history were revealed. Her mother described her as having an artistic personality with a great imagination. She sometimes experienced dreamy states, derealization and depersonalization (for example, when she was going outside, as if on “autopilot”). At 11 years old, the girl had been an object of sexual harassment. A few months prior to the appearance of the tics, she began to feel sad anxious and emotionally flat; therefore, she visited a psychiatrist. The tics started abruptly in February 2021 during online learning in the COVID-19 pandemic and consisted of various motor expressions and complex vocal phenomena that imitated different characters seen, especially those on TikTok, YouTube, memes or video games (Video 1, segment A). She was even able to communicate with her classmate using her tics. The worst manifestations of the patient's tic-like behaviors were associated with a period of her strong interest in RS, watching horror video games (e.g., Five Nights at Freddy's) and the backrooms. She spent several hours a day on these activities and regularly practiced nighttime affirmations trying to create a new “reality,” but, as she said, was never able to “get there.” At this time, she developed an abrupt-onset irregular distractible bilateral postural hand tremor, consistent with the functional tremor [4] (video 1, segment B). Sertraline (125 mg daily), tiapride (200 mg daily) and hydroxyzine (25 mg daily) prescribed for tics and mood disorder had a negligible effect. Psychotherapy provided by the patient's psychiatrist was not effective. After deleting her TikTok account (March 2022) and returning to everyday life after COVID-19 restrictions, her

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tics and tremor gradually disappeared. Since autumn 2022, the patient is asymptomatic, except for the situations when she can display tics “on demand.” The duration of the disease was approximately 1.5 years.

FMD refers to a group of movement abnormalities that are clinically incompatible with movement disorders associated with neurologic disease. Alteration of the movements by distraction or nonphysiologic maneuvers and other positive signs are essential in supporting phenotype-based diagnosis. The therapy for FMD should be a process that starts with explaining the diagnosis in a way that helps the patient understand it and gain confidence in it. This in turn enhances the adherence to and success of therapeutic strategies. Psychotherapy, cognitive behavioral therapy and particularly specific physical therapy techniques may be effective [5, 6]. According to a meeting of the European Society for the Study of Tourette Syndrome (Lausanne, June 2022), our patient meets criteria for clinically definite functional tic-like behaviors [7].

Except for TikTok, little is known about the other traps on the Internet leading to similarly harmful consequences, as in our patient. RS is a trendy mental activity that also emerged abruptly following the outbreak of the COVID-19 pandemic. RS has been used online on several platforms, such as TikTok, mainly by the post-millennial generation. It refers to the experience of moving consciousness into an alternative, so-called “desired reality”. There are several methods used to facilitate this experience, e.g., relaxation, concentration of attention or autosuggestion. For instance, the method involves ten minutes of meditation in a “starfish position”, counting up to 100, and focusing on the desired reality while falling asleep. The aim is to wake up to such a reality. To some extent, these techniques are likely to use lucid dreaming and self-hypnosis. The successful implementation of RS stems from a combination of necessary individual characteristics (e.g., suggestibility) and self-training, which is influenced by cultural factors (e.g., social network trends) and motivating factors (e.g., novelty seeking, creativity) [8]. The backrooms is an online escape-horror game originating from creepypasta (horror-related legends shared around the Internet). As stated in internet descriptions, entering the backrooms requires “noclipping”—randomly slipping inside without the player’s control by phasing through walls or other solid objects in different video games. Noclipping was originally used by developers as a way to test games, and became popular as a player cheat as it allows the gamer to zip between game levels. Even if the backrooms are not real, they are designed as though they are. Examples include the Internet aesthetic of liminal spaces, which usually depicts busy locations as unnaturally empty (hallways, office rooms, etc.) [9]. These spaces with no windows are infinite, usually composed of yellow walls and carpets and illuminated with constantly buzzing fluorescent lights, making them eerie-looking. In the spaces that behave unpredictably

(they loop, twist or double themselves), the player might meet other trapped players or monsters, and it is very unlikely that players will ever be able to exit [10]. For our patient, all these unpredictable characteristics were highly stressful and caused anxiety, which may be one of the triggers of tic onset.

Our patient displayed quite typical manifestations of TikTok/functional tics. The presence of coexisting functional tremor highlights their functional origin. However, this case brings some other psychological points to help us think about the FMD in a more complex manner. Her creative personality, mood disorder and history of sexual harassment are strong predictors of FMD. Her sense of fantasy and derealizations could possibly also contribute. Moreover, as she developed FMD after a period when she was trying to find a new reality, a classic dissociative component (which was matter of debate in developing psychogenic movement disorders in the past) should be still considered in the psychopathology of FMD again.

Social media have an even greater negative impact on the quality of life of young people. Our patient explained how fast Internet “algorithms” can catch a victim and allow us to fall into a trap. Not only TikTok or YouTube, but many contemporary platforms, including RS or the backrooms, can induce tic-like behaviors and FMD. Now, after she is feeling better, she herself prompted us to publish this report to disseminate the awareness of the negative influence of social media on young people.

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Declarations

Conflicts of interest The authors declare that they have no conflict of interest.

Ethical standard statement The present study was approved by the Hospital ethics committee.

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