

# research snapshot

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## The potential use of theta brain stimulation to treat gambling disorder

### What this research is about

Gambling disorder (GD) is an addictive disorder. It is diagnosed in people whose gambling results in harm in personal, financial, and/or occupational functioning. Clinicians have used a variety of methods to treat people with GD. To date, only cognitive behavioural interventions have strong evidence as treatment for GD.

There is growing interest in using non-invasive brain stimulation (NIBS) techniques. NIBS involves stimulating the brain to encourage or prevent brain activity and brain cell growth in particular regions of the brain. One NIBS technique called theta burst stimulation (TBS) is a possible treatment for GD. TBS could be used to target the pre-supplementary motor area (pre-SMA). The pre-SMA is a brain region involved in response inhibition. Response inhibition is the act of resisting an urge or a need to respond to something. In GD, response inhibition could be stopping oneself from gambling when the urge arises.

The aim of this study was to examine the potential use of TBS to target the pre-SMA in people with GD. The researchers' intention was to use this study as a proof-of-concept of using TBS to treat GD. This means testing whether it is feasible to use TBS to treat GD.

### What the researchers did

The researchers recruited six people over the age of 18 who were diagnosed with GD. There were five men and one woman. Their ages ranged from 30 to 64 years old. None of the participants had co-occurring mood disorders.

At the baseline assessment, participants were interviewed by psychiatrists to ensure that they met

### What you need to know

Gambling disorder (GD) is a mental disorder where people struggle to control their gambling. A potential way to treat GD is to stimulate particular regions in the brain. Brain stimulation has been used to encourage or discourage brain activity in the treatment of addictive disorders, such as substance uses. The pre-supplementary motor area (pre-SMA) is thought to be involved in GD. The authors of this study proposed using a non-invasive brain stimulation technique called theta burst stimulation (TBS) to target the pre-SMA. They recruited six adults with GD. The participants completed baseline measures that included assessment of GD symptoms, overall functioning, and other mental health measures. The measures were repeated ten days into treatment (T2) and thirty days after treatment (T3). The authors found that symptoms of GD declined significantly from baseline to T2 and plateaued from T2 to T3. Overall functioning also improved. Other measures of mental health did not change during the course of treatment.

the diagnosis of GD according to the DSM-5 criteria. Their symptoms of GD were measured with the Yale-Brown Obsessive-Compulsive Scale (PG-YBOCS). The Hamilton Anxiety (HAM-A) and Depression Scales (HAM-D) were used to assess symptoms of anxiety and depression, respectively. The Gambling Urges Questionnaire (GUQ) was used to measure gambling urges. Impulsivity was measured by the Barratt Impulsiveness Scale (BIS-11). Impulsivity is a tendency to act rashly and to act without planning. The Clinical Global Impression Scale (CGI) was used to measure

overall functioning. The Sheehan Disability Scale (SDS) was used to measure symptoms of disability related to mental health conditions. Nicotine dependence was assessed by the Fagerstrom Test for Nicotine Dependence (FTND).

These measures were administered on the 10<sup>th</sup> day of treatment (Time 2; T2) and thirty days after the completion of treatment (Time 3; T3). Treatment consisted of 10 sessions of TBS. TBS was applied to both halves of the participants' pre-SMA. Side effects of the treatment were monitored every week to ensure it was safe and tolerable.

### What the researchers found

The researchers found that scores on the PG-YBCOS decreased substantially from baseline to T2, but did not continue to decline from T2 to T3. Scores on the GUQ did not change from baseline to T2 to T3. This indicated that symptoms of GD decreased over the course of treatment, but gambling urges did not. Similarly, scores on the BIS-11 (impulsivity), HAM-A (anxiety), HAM-D (depression), SDT (disability), and FTND (nicotine dependence) did not decrease from baseline to T2 and T3. However, scores on the CGI, which measured overall functioning, significantly decreased from baseline to T2, but did not continue to decline from T2 to T3. The TBS treatment was safe and tolerable.

Overall, the results of this study suggest that TBS may help in reducing symptoms related to GD and may improve overall functioning. TBS does not appear to improve gambling urges and other measures of mental health such as anxiety and depression.

### How you can use this research

This study provided initial proof-of-concept for using TBS to treat people with GD. The researchers found that symptoms of GD decreased substantially during the course of treatment with TBS. This suggests that TBS that targets the pre-SMA may be a promising technique to treat GD.

### About the researchers

**Luana Salerno** and **Eleonora Grassi** are affiliated with Istituto di Neuroscienze in Florence, Italy. **Nikos**

**Makris** is affiliated with the Department of Psychiatry at the Massachusetts General Hospital, Harvard Medical School in Boston, Massachusetts, USA.

**Stefano Pallanti** is affiliated with the Albert Einstein College of Medicine in Bronx, New York, USA. For more information about this study, please contact Luana Salerno at [salerno.luana@gmail.com](mailto:salerno.luana@gmail.com)

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