



European Congress of Psychiatry, Paris: press release

Scientists show that odours from other people's sweat can help treat social anxiety.

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Type of study: not peer-reviewed/experimental study/human subjects¹

A group of European researchers have shown that exposure to human odours, extracted from other people's sweat, might be used to boost treatment for some mental health problems.

In a preliminary study, the researchers were able to show that social anxiety was reduced when patients underwent mindfulness therapy while exposed to human 'chemo-signals', or what is commonly referred to as body odour, obtained from underarm sweat from volunteers. Presenting the results of a pilot study at the European Congress of Psychiatry in Paris, lead researcher Ms Elisa Vigna, of the Karolinska Institute in Stockholm said:

"Our state of mind causes us to produce molecules (or chemo-signals) in sweat which communicate our emotional state and produce corresponding responses in the receivers. The results of our preliminary study show that combining these chemo-signals with mindfulness therapy seem to produce better results in treating social anxiety that can be achieved by mindfulness therapy alone".

Social anxiety is a common mental health condition where people worry excessively about participating in social situations. This can affect interactions, for example within the workplace or relationships, but also in everyday situations such as shopping or holidays. This may make it difficult to lead a normal life without excessive worrying about contact with others².

The study involved collecting sweat from volunteers, and then exposing patients to chemo-signals extracted from these sweat samples, while they were being treated for social anxiety. The sweat samples were collected from volunteers who were watching short clips from movies: these films had been chosen to elicit particular emotional states such as fear or happiness; this was to see if the specific emotions experienced while perspiring had differing effects on the treatment. The clips from fearful movies included content from horror films such as *The Grudge*. The 'happy' clips included material from [Mr Bean's Holiday](#), [Sister Act](#), and others.

Once the sweat had been collected, researchers recruited 48 women (aged between 15 and 35), all of whom suffered from social anxiety, and divided them into 3 groups each of 16 people. Over a period of 2 days, they all underwent mindfulness therapy for social anxiety. At the same time, each group was exposed to a different odour, obtained from the sweat samples of people who had seen different types of video clips, plus a control group, which was exposed to clean air.

Elisa Vigna said *"We found that the women in the group exposed to sweat from people who had been watching funny or fearful movies, responded better to mindfulness therapy than those who hadn't been exposed. We were a little surprised to find that the emotional state of the person producing the sweat didn't differ in treatment outcomes – sweat produced while someone was happy had the same effect as someone who had been scared by a movie clip. So there may be something about human chemo-signals in sweat generally which affects the response to treatment.*



It may be that simply being exposed to the presence of someone else has this effect, but we need to confirm this. In fact, that is what we are testing now in a follow-up study with a similar design, but where we are also including sweat from individuals watching emotionally neutral documentaries. This should allow us to tease out whether any potential therapy benefits stem from the unconscious perception of specific emotional signals, or whether it is simply to do with human presence, irrespective of emotion.”

Ms Vigna continued *“We found that individuals who undertook one treatment session of mindfulness therapy together with being exposed to human body odours showed about 39% reduction^{see note 3} in anxiety scores). For comparison, in the group receiving only mindfulness (i.e., the control group) we saw a 17% reduction in anxiety scores after one treatment session.*

We are hopeful that this may lead to a new way of helping people with Social Anxiety Disorder, for example increasing the effectiveness of standalone e-health interventions (such as meditation apps) or provide an additional opportunity for those who don’t respond to current treatment. However, we caution that this is a proof-of-concept study, which is why we are now embarking on a bigger study to confirm the findings”.

Human sweat is complex and variable in the way it carries information. The researchers are working with analysts at the University of Pisa who have been able to identify over 300 separate compounds in human sweat. The researchers hope that if they can identify and isolate the molecules which are causing the effects seen in the study, then therapeutic use will become easier.

Dr Julian Beezhold (University of East Anglia, Secretary General of the European Psychiatric Association) commented:

“We welcome this study, looking at one of the least researched senses and its interaction with mental health. The findings are interesting but will need to be robustly replicated by independent researchers.”

This is an independent comment, Dr Beezhold was not involved in this work.

The European Congress of Psychiatry takes place from 25-28 March 2023, in Paris. It is Europe’s largest congress dedicated to psychiatry, with around 4500 attendees <https://epa-congress.org/>

This work is part of the POTION project. POTION (“Promoting Social Interaction through Emotional Body Odours”) is an EU-funded Horizon 2020 project <https://cordis.europa.eu/project/id/824153>

Notes

- 1 *This indication is part of a project from the Academy of Medical Sciences to improve press release communication. See <https://tinyurl.com/37pp49xu>*
- 2 *For background on social anxiety, see <https://www.nhs.uk/mental-health/conditions/social-anxiety/>*
- 3 *Measured with the State-Trait Anxiety Inventory, STAI, a commonly used measure where higher scores indicate higher anxiety levels*

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Notes for Editors

Conference Abstract (**Note** – the sample size of the preliminary experiment changed after the submission of the abstract. The correct sample size is that contained in the press release, 48.



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Affective and physiological responses to human body odors in social anxiety – a pilot study on the possible effects as catalyst for treatment

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Introduction: Understanding the way chemistry influences human communication is important since the reaction to chemosignals has many implications for science and society.

Numerous research points out that human beings are able to identify feelings of fear and happiness through smell. Such emotional information can lead to approach-avoidance behaviors or changes in affective state. Moreover, a heightened sensitivity to social odors has been shown in subjects with social anxiety symptoms. However, more detailed research on the connection between olfaction, affective psychiatric disorders and interpersonal social communication is required.

POTION is an EU funded project within the Horizon2020 initiative that aims at understanding the nature of chemosignals in humans and their sphere of influence on social interaction. Within this project, we conducted a preliminary study showing that individuals with social anxiety symptoms benefited from mindfulness training especially when exposed to social chemosignals. A significant reduction in anxiety symptoms was achieved with both the happiness ($t(25)=4.37$, $p=0.029$) and the fear ($t(25)=4.35$, $p=0.031$) chemosignals. Moreover, individuals exposed to the happiness chemosignal exhibit higher vagal tone compared to subjects exposed to fear chemosignals ($p = 0.026$), indicating overall increased well-being.

Objectives: Given the exploratory nature of the preliminary study, an hypothesis driven pilot-RCT with larger sample size and refined design has been conducted. The aim was to further explore the catalyst effect of body odor on anxiety reduction. Notably, if the odor groups (happiness, fear or neutral) differ with the control group (clean air) and if they differ between each other in the outcome measure.

Methods: To this end, 96 participants with social anxiety symptoms (women aged between 18 to 35) were randomly allocated to one exposure group (happiness, fear or neutral human body odor or clean air) and followed a mindfulness intervention while being exposed to the odor. Psychological outcomes were measured before and after the intervention through the State-Trait Anxiety Inventory. During the intervention participants' skin conductance and heart rate was also measured. Analysis of variance will be performed to assess psychological outcome differences between and within groups, as well as interactions (Group \times Time).

Results: Results of the study will be available and presented at the time of the congress.