

Type of presentation: Oral Presentation

Submission ID 1: Relationship between Anxiety Level and Sleep Quality in Diabetes Mellitus Patients at Grogol Petamburan Primary Health Care Facility in Jakarta

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- **Abstract topic:** Comorbidity disorders
- **Type of presentation:** Oral Presentation

Anxiety can occur due to a medical disorder, one of which is diabetes mellitus. In a state of illness, a person can experience changes during his illness, both because of his illness and because of the treatment he receives. Individuals who experience these medical disorders can experience an increase in sleep quality, or a decrease in sleep quality as a result of anxiety experienced due to the treatment received or because of the disease. This study aims to determine the relationship between anxiety levels and the quality of sleep of patients with Diabetes Mellitus (DM) at Grogol Petamburan Public Primary Health Care Facility in Jakarta. The type of research used is non-experimental quantitative research with correlational methods using a cross sectional approach. There were 97 respondents. The results showed that out of 97 respondents studied, 41 respondents experienced moderate anxiety and 15 respondents experienced severe anxiety. 97 respondents were studied, 62 people were found to have good quality of sleep, and 35 people had poor quality of sleep. The statistical test carried out in this research is the spearman test and the value spearman correlation value $r = 0.564$ and a value of

$p=0.000$ in patients with DM caused a conclusion that the higher or more the level of anxiety level of DM sufferers owned by a person, the more decreased sleep quality of patients with diabetes mellitus and vice versa.

Submission ID 3: Decreased coupling of default mode and affective network during resting-state in adolescent depression

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- **Abstract topic:** Depression
- **Type of presentation:** Oral Presentation

Objective

Altered prefrontal-amygdala resting-state connectivity is described in both, adolescent and adult MDD (Tang et al., 2018; Chattopadhyay et al., 2019; Jamieson et al., 2021). Cognitive behavioral therapy normalizes the altered connectivity in adolescent MDD (Straub et al., 2017). Our study investigates resting-state connectivity between key nodes of the default mode network (DMN; medial prefrontal cortex and posterior cingulate) and the affective network (AN; dorsal anterior cingulate and bilateral amygdalae). We hypothesized that (1) participants with MDD show alterations of connectivity between AN and the DMN (Cullen et al., 2014) and (2) changes in prefrontal excitation-inhibition balance (Clark et al., 2018) compared to healthy controls.

Methods

Thirty adolescents with MDD (age: M=16.1 SD=1.4, 20 females, 18 SSRI treatment) and 32 healthy controls (age: M=16.2 SD=1.9, 20 females) underwent a 6 minutes resting-state fMRI with eyes open. Preprocessing included despiking, slice-timing correction, realignment, multi-echo denoising (TEDANA), normalization, and smoothing with a 6mm (FWHM) Gaussian kernel. The summarized signal from a 12-mm sphere centered on the individual peak around the key nodes in the DMN and AN was extracted and used for analysis. We conducted a spectral dynamical causal modelling analysis in the parametric empirical Bayes framework to study the effective connectivity in the between the DMN and the AN. This method allows to model the directed relationships between brain networks and determines regions that are driving activity in other regions and their respective input sensitivity (i.e., self-inhibition).

Results

We found evidence that the DMN receives weaker inhibition from the AN in adolescent MDD during rest. In addition, self-inhibition of the medial prefrontal cortex and the anterior cingulate was decreased, rendering the regions more sensitive to input from other regions compared to healthy controls. Finally, we found that patients medicated with SSRIs showed increased self-inhibition of the medial prefrontal cortex compared to unmedicated patients.

Conclusion

Our study identifies hierarchical alterations between brain regions relevant for self-referential processing (DMN) and emotional responses (AN) that have not been highlighted in adolescent MDD. Our results shed light on a potential mechanism of how unattenuated connectivity from AN might emotionally color self-referential processing in the DMN which could contribute to persistent symptoms experienced by affected adolescents. Furthermore, our findings suggest a potential mechanism of how SSRI administration could dampen the influence of the AN by reestablishing the excitatory-inhibitory balance in the DMN. Overall, our study adds to the growing body of literature emphasizing the prefrontal-amygdala interactions as potential biomarker target in adolescent depression to prevent long-term negative effects on mental health.

Submission ID 10: Hair Endocannabinoids and Glucocorticoids in 264 Children and Adolescents with MDD and Healthy Controls: Indications for Reduced AEA and Cortisol Levels in MDD

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- **Abstract topic:** Depression
- **Type of presentation:** Oral Presentation

Objective: Major Depressive Disorder (MDD) is increasingly prevalent in children and adolescents, yet detection remains challenging in this demographic. Symptoms in younger populations differ from those in adults, often leading to under-diagnosis, serious long-term implications, and the need for effective biomarkers. This study explores the potential of the endocannabinoid system (ECS), specifically anandamide (AEA) levels in hair and the hypothalamus-pituitary-adrenal (HPA) axis with its main effector cortisol in hair, as such biomarkers. Hair analyses have the potential to detect long-term integrated concentrations over months compared to blood analyses, which reflect the immediate circulatory situation.

Methods: Utilizing data from the omega-3-pMDD trial, a phase III Randomized Control Trial assessing the efficacy and safety of omega-3 fatty acids in pediatric MDD, we examined AEA and cortisol hair concentrations in 264 children and adolescents aged 8-17 years, with and without MDD. Associations between symptom severity, pubertal status, and hair concentrations, alongside sex differences in concentrations, were also explored.

Results: Analysis showed lower AEA and cortisol concentrations in the hair of children and adolescents with MDD compared to healthy controls. An exploratory observation was higher stearoylethanolamide (SEA) hair concentrations in non-responders at the study's end. Although these results offer initial insights, the longitudinal analyses currently underway will further elucidate these associations and will be presented at the conference.

Conclusion: Our findings suggest a potential role for AEA and cortisol as biomarkers for MDD in younger populations. We hypothesize that omega-3 fatty acid supplementation may increase AEA and cortisol levels, thus potentially normalizing initially low levels observed

in MDD cases. These results hold implications for early detection, diagnosis, and therapeutic response prediction in pediatric MDD. However, further research is required to validate these findings and to deepen our understanding of the ECS and the hypothalamus-pituitary-adrenal (HPA) axis, and their interplay in pediatric MDD.

Submission ID 12: Sex differences in cortisol secretion in depression: a systematic review and meta-analysis

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- **Abstract topic:** Biomarkers of stress and anxiety
- **Type of presentation:** Oral Presentation

Higher prevalence rates of depression in females than in males might be associated with sex-specific activation of the hypothalamic-pituitary-adrenal (HPA) axis, as well as the sex-specific cortisol secretion, which is the primary glucocorticoid end product of the HPA axis in humans. Evidence exists that cortisol differs between healthy females and males, however so far, a sex-specific cortisol secretion in depression has not been systematically assessed. Thus, the current systematic review and meta-analysis were conducted to quantify the existing literature on different cortisol parameters (1) basal cortisol; (2) hair cortisol; (3) cortisol awakening response (CAR); (4) cortisol stress reactivity comparing depressed females and males as well as sex-specific comparisons with healthy controls. Following an extensive literature research, a total of 50 original articles were included. Females with depression had significantly higher hair cortisol, higher CAR, and lower cortisol stress reactivity compared to males with depression. In comparison with healthy females, female patients had significantly higher evening basal cortisol, higher CAR and lower cortisol stress reactivity. Male patients showed significantly higher overall, morning and evening basal cortisol than male controls. Thus, sex as a fundamental driver of dysfunctional cortisol secretion in depression needs to be considered. More rigorous research into the interaction of sex and other factors, as well as the neural mechanisms underlying sex-specific cortisol secretion in depression is warranted.

Submission ID 13: Robin Z: Transdiagnostic smartphone app to support adolescents with psychiatric symptoms

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- **Abstract topic:** Management of stress and anxiety
- **Type of presentation:** Oral Presentation

Robin Z: Transdiagnostic smartphone app to support adolescents with psychiatric symptoms

Background

There has been increasing interest in the development of innovative technologies in the health sector because they can improve the accessibility, effectiveness, quality, and cost-effectiveness of treatment. Although many apps are available for young people with mental health problems, most of these have not been developed by professionals, and their effectiveness has not been evaluated. Based on these considerations, we developed the smartphone App Robin Z to support adolescents in psychiatric treatment. Robin Z is intended as a resource-oriented, transdiagnostic therapy-tool to support self-efficacy. It aims real-time symptom-assessment, to offer help in coping with symptoms and stressful situations in everyday life and to support medication adherence. It is currently applied in both inpatient and outpatient settings, regardless of the diagnosis

Despite preliminary encouraging research findings supporting the use of smartphone technology in psychotherapy, it remains unclear whether the consistent use of smartphone technology in outpatient clinics is practical outside of research projects. Thus, it is uncertain whether patients will engage with this technology over an extended period of time and whether clinicians will be willing to integrate this new technology into their current clinical practices. In view of these factors, it is crucial to evaluate the use of smartphone apps for their applicability, effectiveness, and efficiency in clinical context. Therefore, we conducted an evaluation of the use of the smartphone app Robin Z to identify barriers in clinical implementation plus to assess the usability and applicability of the Robin Z app in clinical practice.

Robin Z is also applied in several research projects of our clinic, among others in a suicide prevention program, the evaluation of a new inpatient and outpatient crisis intervention center and in a treatment study for adolescents with an increased risk of psychosis.

Methods and Results

At the congress, we will first of all present the data on clinical implementation of the clinical implementation of Robin Z in four community-based outpatient services of the Department of Child and Adolescent Psychiatry and Psychotherapy in Zurich, Switzerland. Therefore, we collected data of 27 adolescent patients and their caregivers (N=15) over a six-week period. They all completed questionnaires on user-friendliness and satisfaction with Robin Z. This evaluation will provide data on feasibility, usability, and acceptability with the Robin Z smartphone app.

Furthermore, we will show initial results on the use of the app in the different research projects.

Discussion

Although many apps are available for young people with mental health problems, most of these have not been developed by professionals, and their effectiveness has not been evaluated. To the best of our knowledge, Robin Z is one of the first transdiagnostic apps developed by clinical experts as an additional tool to support psychotherapy for adolescent patients.

The results of this evaluation are of clinical importance to the field of eMental Health.

Submission ID 14: Blood transcriptome analysis suggests an indirect molecular association of early life adversities and adult social anxiety disorder by immune-related signal transduction

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- **Abstract topic:** Stress-related and anxiety disorders
- **Type of presentation:** Oral Presentation

Blood transcriptome analysis suggests an indirect molecular association of early life adversities and adult social anxiety disorder by immune-related signal transduction

Social anxiety disorder (SAD) is a psychiatric disorder characterized by severe fear in social situations and avoidance of these. Multiple genetic as well as environmental factors contribute to the etiopathology of SAD. One of the main risk factors for SAD is stress, especially during early periods of life (early life adversity; ELA). ELA leads to structural and regulatory alterations contributing to disease vulnerability. This includes the dysregulation of the immune response.

However, the molecular link between ELA and the risk for SAD in adulthood remains largely unclear. Evidence is emerging that long-lasting changes of gene expression patterns play an important role in the biological mechanisms linking ELA and SAD. Therefore, we conducted a transcriptome study of SAD and ELA performing RNA sequencing in peripheral blood samples. Analyzing differential gene expression between individuals suffering from SAD with high or low levels of ELA and healthy individuals with high or low levels of ELA, 13 significantly differentially expressed genes (DEGs) were identified with respect to SAD while no significant differences in expression were identified with respect to ELA. The most significantly expressed gene was MAPK3 ($p = 0.003$) being upregulated in the SAD group compared to control individuals. In contrary, weighted gene co-expression network analysis (WGCNA) identified only modules significantly associated with ELA ($p \leq 0.05$), not with SAD. Furthermore, analyzing interaction networks of the genes from the ELA-associated modules and the SAD-related MAPK3 revealed complex interactions of those genes. Gene functional enrichment analyses indicate a role of signal transduction pathways as well as inflammatory responses supporting an involvement of the immune system in the association of ELA and SAD.

In conclusion, we did not identify a direct molecular link between ELA and adult SAD by transcriptional changes. However, our data indicate an indirect association of ELA and SAD mediated by the interaction of genes involved in immune-related signal transduction.

Submission ID 15: Trajectories of suicidal ideation in children and adolescents with major depressive disorder

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- **Abstract topic:** Depression
- **Type of presentation:** Oral Presentation

Trajectories of suicidal ideation in children and adolescents with major depressive disorder

PURPOSE: Suicidal ideation is common in depressed adolescents, and suicidal ideation can sometimes persist even when other depressive symptoms improve. Identifying factors associated with different trajectories of suicidal ideation and depressive symptoms is important to identify high-risk populations and improve clinical care.

METHODS: Depressive symptoms and frequency of suicidal ideation were measured in 257 children and adolescents diagnosed with major depressive disorder (MDD) over a 9-month period. Growth mixture modeling was used to examine different latent trajectories of depressive symptoms and suicidal ideation. Logistic regression models were used to identify predictors of trajectories at baseline.

RESULTS: Twenty-nine percent of the adolescents had few suicidal ideation during the course of the study. Of the remaining adolescents, 42% showed a gradual decline in suicidality throughout the nine months, while 21% showed chronically elevated suicidal ideation. Of the youth with chronically elevated suicidal ideation scores, 70% had limited improvement and 30% had marked improvement in other depressive symptoms over the nine months. While both groups with high suicidal ideation exhibited increased hopelessness at baseline, adolescents with declining suicidal ideation were less likely to engage in nonsuicidal self-injurious behavior.

CONCLUSION: Chronically elevated suicidal ideation in adolescents may persist even when other depressive symptoms improve. Non-suicidal self-injurious behavior is associated with slower or no recovery from suicidal ideation. Therefore, treating nonsuicidal self-injurious behavior in adolescents with major depressive disorder may be crucial for suicide prevention strategies.

Submission ID: 20

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- **Abstract topic:** COVID-19, stress and anxiety
- **Type of presentation:** Oral Presentation

Objectives

Pregnant women are likely to experience high levels of stress during the COVID-19 pandemic. However, the factors, which might influence the levels of experienced emotional distress, are not well understood. Therefore, we aimed to investigate potential correlates of prenatal emotional distress during the COVID-19 pandemic.

Methods

In total, N=1,437 pregnant women from Germany and Switzerland took part in an online study during the first wave of the COVID-19 pandemic (May-August 2020). The survey assessed prenatal distress, pandemic-related pregnancy stress, general anxiety, and fear of childbirth as well as several socio-demographic, pregnancy-related and COVID-19-related factors. Linear multivariate regression models were the main analytical strategy.

Results

The results highlight that several factors such as fulltime employment, nulliparity, high-risk pregnancy, emotional problems, cancelled prenatal appointments, and stating that COVID-19 affected the choice of birth mode were significantly associated with elevated prenatal distress, anxiety, pandemic-related pregnancy stress, and fear of childbirth. On the other hand, access to an outdoor space was a protective factor for pandemic-related pregnancy stress and prenatal distress.

Conclusions for Practice

Overall, the study highlights significant correlates influencing the levels of emotional distress pregnant women experienced during the COVID-19 pandemic. These findings may contribute to the improvement of maternal prenatal medical and psychological care during a public health crisis of international concern, such as the COVID-19 pandemic.

Significance

Pregnancy is a time of increased vulnerability for mental problems. There is insufficient information on the psychological impact of the COVID-19 pandemic on pregnant women's mental response. Our findings suggest that high-risk pregnancy, fulltime employment, cancelled prenatal care appointments and stating that COVID-19 affected the choice of birth mode were risk factors for pandemic-related pregnancy stress. Additionally, current emotional problems, nulliparity, chronic disease, history of abuse, and income loss were linked to higher prenatal distress. Similarly, these factors increased anxiety and fear of childbirth. Access to an outdoor space was a protective factor for pandemic-related pregnancy stress and prenatal distress.

Submission ID: 23

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- **Abstract topic:** Stress and anxiety in children and adolescents
- **Type of presentation:** Oral Presentation

Title: Sensor-based detection of stress and anxiety in telemedical treatment of children and adolescents with obsessive-compulsive disorder

Objective: Telemedical interventions enable the enhancement of state-of-the-art behavioral therapy for obsessive-compulsive disorder (OCD) as treatment can be delivered in the patient's immediate environment. The feasibility study "Sensor-based detection of stress and anxiety in telemedical treatment of children and adolescents with obsessive-compulsive disorder (SSTeP-KiZ) aims to further develop online-based therapy by using advanced sensor technology in exposure exercises that allow for more valid symptom actualization by treating patients at home. Of crucial importance is the recording of relevant emotional states such as stress and anxiety during therapy sessions, which are reliably quantified by combining different sensor modalities. Thereby, the therapy process can individually be adapted to the patient and the situation, thus optimizing the success of the treatment. In a preliminary study, our research group was already able to demonstrate the efficacy of telemedical access. Until now, such a sensor-based approach has not been implemented in pediatric OCD. In the context of this feasibility study, SSTeP KiZ wants to examine whether the use of sensor technology in the home environment and independent application by patients is possible.

Methods: In the first period of the project, the therapy system was developed on a sample of 5 healthy children and 11 children with OCD aged 12-18 years and subsequently evaluated on 20 patients with OCD of the same age group in 14 weekly therapy sessions via teleconference. During the sessions and exposures, patients' gaze and pupillometry were recorded via eye trackers, while the heart rate was captured by an ECG chest belt to identify stress responses. With inertial sensors, movements were captured to detect approach and avoidance behaviors. These indicators were transferred to the therapist in real time to optimize the therapy process. An app was developed to record the children's self-rated symptoms and emotional states on a daily basis. Feedback from the parents and therapists was also collected and evaluated.

Results: Our experience with SSTeP KiZ so far shows that the implementation of the study design is basically feasible and that the technology has been well accepted by patients.

Currently, our study is in the evaluation period. The first promising results indicate a successful application of sensor-based psychotherapy as well as significant symptom reduction in pediatric OCD.

Conclusion: This approach has the potential to overcome the limitations of internet-based interventions by allowing real-time objective data to be sent to the therapist during exposure treatments, thereby allowing therapy to be better individualized. At the same time, technical support also requires a significant investment of time and human resources to make the technology work.

Submission ID: 24

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- **Abstract topic:** Biomarkers of stress and anxiety
- **Type of presentation:** Oral Presentation

Investigating diurnal cortisol across the menstrual cycle

Background: In the activity of the hypothalamic–pituitary–adrenal (HPA) axis sex differences are evident. Further, interactions between ovarian hormones and the HPA axis have been demonstrated, for example in relation to fluctuating hormones across the menstrual cycle. Meta-analytic evidence revealed higher basal cortisol concentrations in the luteal compared to the follicular phase (more precisely the menstrual vs. premenstrual phase). However, previous studies almost exclusively used single measures to assess basal cortisol concentrations. Investigations using high-quality assessments of both, HPA axis activity (including the cortisol awakening response (CAR) and diurnal cortisol) and menstrual cycle characteristics, are lacking. This study investigates fluctuation in the CAR and diurnal profiles in relation to three menstrual cycle phases.

Method: 43 naturally cycling participants with and without depressive disorder took part in a prospective ambulatory assessment study measuring basal cortisol as a marker for HPA axis activity across one menstrual cycle. Two consecutive diurnal profiles (including the CAR) were collected in the early follicular phase, the periovulatory phase and the premenstrual phase, respectively. Ovulation status was assessed with urinary LH-tests.

Results: Differences in the CAR and diurnal cortisol concentrations will be analyzed and compared between cycle phases and groups. The data analysis is still in progress. Results will be presented and discussed.

Conclusion: When conducting stress-research, taking sex differences into account is important. In stress research regarding female individuals, high-quality menstrual cycle phase assessment and high-quality HPA-axis assessment, e.g., with CAR, are needed.

Submission ID: 27

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- **Abstract topic:** Post-traumatic stress disorder
- **Type of presentation:** Oral Presentation

Objective. One third of mothers experience their childbirth as a traumatic experience. This can lead to the development of childbirth-related posttraumatic stress symptoms (CB-PTSS) in 12% of mothers. Despite this prevalence, evidence-based treatments targeting CB-PTSS are lacking. Childbirth-related intrusive memories (CB-IM) are typically depicted as distressing fragments of the childbirth intruding involuntarily into the mind. They are a key CB-PTSS that contribute to the maintenance of other CB-PTSS. Therefore, it is particularly interesting to target CB-PTSS in treatments.

New CB-PTSS treatment strategies have been developed based on the literature on memory reconsolidation. It is hypothesized that the memory of a traumatic childbirth is “over-consolidated” into long-term memory, inducing vivid CB-IM. But the childbirth memory could be reactivated, opening a short time window during which the childbirth memory trace is labile. Emerging evidence support the assumption that a brief narration of the traumatic event followed by a visuospatial task aiming to interfere with memory reconsolidation can reduce the number of IM and PTSS in clinical populations. Therefore, this translational proof-of-principle study aimed at testing the efficacy of a single-session behavioral intervention, supposed to interfere with memory reconsolidation and reduce CB-IM and CB-PTSS.

Methods. In this pilot single-group pre-post study, 18 women reporting frequent CB-IM received a single-session behavioral intervention including a brief oral evocation of the childbirth (assumed memory reactivation) followed by a visuospatial task (assumed interference with memory reconsolidation). Participants reported their CB-IM in daily diaries during the two weeks pre-intervention (diary 1), the two weeks post-intervention (diary 2), and the 5th and 6th weeks post-intervention (diary 3). The PTSD Checklist for DSM-5 (PCL-5) was used to assess CB-PTSS just before the intervention and at one month post-intervention. Participants completed feedback questionnaires at the end of study procedures to evaluate the acceptability of the intervention.

Results. In comparison to diary 1, there was a median (IQR) reduction of the number of CB-IM of 81.89% (39.58%) in diary 2, which was sustained in diary 3 ($n = 17$). 15/18 participants had a reduction of at least 50% of CB-IM in diary 2. At one month post-intervention, CB-PTSS severity was decreased of at least 50% in 10/18 participants. Of the 8 participants with a childbirth-related posttraumatic stress disorder diagnosis pre-intervention, none met diagnostic criteria post-intervention. In addition, the intervention

was evaluated as highly acceptable.

Conclusion. This single-session behavioral intervention could present a low-burden treatment solution for women suffering from CB-PTSS. These promising results justified the launch of a randomized controlled trial which is currently ongoing and whose design will also be presented during the congress. In this single-blind waitlist-controlled randomized controlled trial, we plan to recruit 120 participants in total, allocated to two different groups (1:1): the immediate intervention group and the delayed intervention group. The study sample and the intervention procedures are the same as in the pilot pre-post study.

Submission ID: 34

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- **Abstract topic:** Experimental stress and anxiety research
- **Type of presentation:** Oral Presentation

Objective: Blunted cardiovascular responding to stress in the laboratory is associated with addiction, obesity, life stress, and early life adversity. However, recent criticisms of empirical work have suggested that these associations arise due to the prevalent use of asocial, personally irrelevant tasks used as experimental manipulations of a stressful experience in the laboratory. We present data from two independent studies that refute this argument. Method: In both studies, participants completed a traditional cardiovascular reactivity protocol whereby they engaged in a formal resting baseline period, followed by engagement in a stress-task. Cardiovascular function was assessed during resting and task periods. In both studies, participants completed a mental arithmetic with verbal response return and a personally salient speech task. Results: For Study 1 (N = 136), analyses confirmed that life stress was associated with blunted systolic blood pressure reactivity to the personally salient stress, $\beta = -.20$, $p = .021$, as well as with blunted diastolic blood pressure reactivity to both personally salient, $\beta = -.24$, $p = .004$, and non-salient stress, $\beta = -.20$, $p = .023$. In Study 2 (N = 206), a similar pattern was evident for cynical hostility: those high in cynical hostility showed blunted cardiovascular reactivity to both high hostile stress and non-hostile stress manipulations (all $ps < .05$). Conclusion: These data refute the argument that blunted cardiovascular reactivity to stress arises due to the use of personally non-salient stress-tasks. Rather, the data presented indicate that blunted cardiovascular responding generalises across different stressor contexts; once a blunter, always a blunter.

Submission ID: 42

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- **Abstract topic:** Everyday life stress
- **Type of presentation:** Oral Presentation

Prior stressor experience and being in a position of power in empathic stress

Objective:

Experiencing the stress of others by merely observing a stressed individual is known as empathic stress. Despite the potential adverse health effects for the observer, the mechanisms of empathic stress, specifically the observer's empathic involvement with the stressful situation, remain largely unexplored.

Methods:

In 108 opposite-sex stranger dyads, the observer's empathic involvement with a stressed "target" performing the Trier Social Stress Test (Kirschbaum et al., 1993; TSST) was manipulated. We intended to increase the empathic involvement by exposing observers as targets to the TSST one week beforehand, and conversely, to decrease it by placing observers in a powerful position over the target. A control group without any manipulation was included. We focused on two aspects of empathic stress: stress resonance, which involves the sharing of the target's stress response, and vicarious stress, which emerges irrespective of the target's response.

Results:

Regardless of our manipulation, all observers showed subjective and high-frequency heart rate variability (HF-HRV) vicarious stress responses and resonated with the targets' stress reactivity in cortisol release. Contrary to our hypothesis, prior TSST experience reduced observer's state empathy, resulting in lower cortisol vicarious reactivity. Conversely, the power manipulation led to stronger vicarious stress in overall heart rate activity and HF-HRV reactivity.

Conclusion:

We propose that prior exposure to a stressor diminishes the saliency of the observed situation, making observers less affected by the struggles of the target. On the other hand, being in a position of power may be perceived like a burdensome responsibility, and hence elicits direct stress-like responses in observers.

Submission ID: 44

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- **Abstract topic:** Depression
- **Type of presentation:** Oral Presentation

Future Time Perspective and Depression, Anxiety and Stress in Adulthood

Objective: The way people see their future time can serve important functions in their emotional lives. According to socioemotional selectivity theory (Carstensen, Isaacowitz, & Charles, 1999), when future time is perceived as open or expansive, people are strongly motivated to optimize their future by focusing on options, plans, and goals they can pursue. When people view their future as limited or restricted, the focus shifts from the optimization of future possibilities to the maximization of meaningful activities and emotional experiences in the present. A limited, unclear, and pessimistic view of the future can increase worry about the unpredictable future and negative emotional states. In line with this claim, research has shown that perceptions of future time as limited are associated with more negative states, including reduced reports of depressive symptoms and anxiety (e.g., Hill & Allemand, 2022). However, there is limited research on which aspects of the multidimensional concept of future time perspective (i.e., perceptions of future time in terms of opportunities, extension, constraints; Rohr, John, Fung, & Lang, 2017) are associated with states of depression, anxiety, and especially stress. Methods: The current study employed data from a non-clinical sample of adults (N = 805, mean age: 50 years; age range: 19 to 85 years). Participants completed self-report measures of future time perspective, depression, anxiety, and stress. Results: Findings from structural equation modeling have shown that participants who view their future as having fewer opportunities and less potential for expansion but more constraints (i.e., limited time), report more depressive, anxious, and stressful states. While the correlations with latent depression scores indicate large effects (opportunities: -.45., extension: -.27, constraints: .41, ps < .001) according to effect size interpretation for psychological research (Funder & Ozer, 2019), the correlations with latent anxiety scores (opportunities: -.21., extension: -.11, constraints: .23, ps < .01) and latent stress scores (opportunities: -.25., extension: -.17, constraints: .28, ps < .001) show small to medium effects. As expected, older age was associated with fewer opportunities and less expansion but more constraints (opportunities: -.22, expansions: -.38, constraints: .29, ps < .001). Moreover, results showed that older age was associated with fewer negative states (depression: -.23, anxiety: -.26, stress: -.34, ps < .001). Conclusion: This study provides insights into the associations between subjective perceptions of future time and important clinical outcomes, and thus highlights the clinical

relevance of such perceptions to negative states.

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Submission ID: 45

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- **Abstract topic:** Experimental stress and anxiety research
- **Type of presentation:** Oral Presentation

Adverse childhood experiences have been prospectively associated with cardiovascular disease. It has been proposed that cardiovascular responses to acute psychological stress may be an underlying mechanism. However, whether adverse childhood experiences are associated with blunted or exaggerated cardiovascular responses to stress remains largely unknown. Similarly, variations in the relationship between adverse childhood experiences and cardiovascular reactivity between men and women has not been comprehensively examined. This presentation will (1) use meta-analytic techniques to examine previous work in the field examining the association between adverse childhood experiences and cardiovascular responses to stress, (2) report results from a study examining the relationship between varying types of ACEs and cardiovascular stress reactivity, and (3) present results examining the association between ACEs and habituation of cardiovascular stress reactivity, and whether these results differ between men and women.

Submission ID: 46

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- **Abstract topic:** Stress and anxiety in children and adolescents
- **Type of presentation:** Oral Presentation

Objective: Obsessive-compulsive disorders (OCD) are marked by negative emotions such as disgust, fear, embarrassment, shame, sadness, and anger as well as mental states and processes such as feelings of incompleteness, worry and rumination. These negative emotions and mental states are reflected in autonomic nervous system activity. Wearable biosensors can continuously monitor autonomic nervous system activity such as heart rate and electrodermal activity. Thus, we aimed to test the feasibility of monitoring OCD distress episodes in children and adolescents using a wearable biosensor.

Methods: Nine children and adolescents, ages 10-16 years, with an OCD diagnosis, seeking or in treatment at a mental health center wore a biosensor on their nondominant wrist for up to eight weeks during waking hours. We asked participants to mark when their OCD symptoms caused them distress using an event mark button on the biosensor. We extracted features from heart rate, blood volume pulse, skin temperature and electrodermal activity signals from the biosensor in five-minute windows. Personalized predictive and temporal as well as participant-based generalized predictive machine learning models were trained using leave-one-subject-out and leave-one-week-out cross-validation. User experience was investigated using questionnaires and interviews.

Results: Youths wore the biosensor for an average of 350 hours during their everyday lives and registered an average of 165 OCD-distress events. Preliminary results indicate that classification rates were better than random. Better accuracy was achieved when generalizing across time than generalizing across individuals. Random forest models generalized better temporally, whereas neural networks generalized better to new patients. Personalized models primarily predicted non-events for participants with few registered OCD events. Including training data from other patients with more labeled OCD events, minimally improved recall, or sensitivity. We will also present results from the user experience questionnaires and interviews.

Conclusion: Monitoring OCD episodes in the real world is possible and acceptable with a wrist-worn biosensor. A challenge will be amassing enough registered events from enough individuals to be able to train models of clinical utility. Potential clinical impacts of our findings include decreasing the burden of registering symptoms for patients, developing more objective measures of OCD symptom severity, increasing awareness of the burden and

timing of symptoms for patients and parents, and developing means of providing biofeedback during exposure therapy sessions patients complete in the clinic and at home. This pilot demonstrated sufficient feasibility of a large-scale study. We will discuss how feedback from the user experience questionnaires and interviews will inform improvement of data collection procedures.

Submission ID: 55

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- **Abstract topic:** Neurobiology of anxiety and stress
- **Type of presentation:** Oral Presentation

Objective: Concerning perinatal mental health, adverse subjective birth experience (BE) is a known risk factor of postpartum depression (PPD). Therefore, our study aimed at identifying individuals at risk of such adverse BE. Moreover, we examined the relationship of adverse BE with consequent PPD. We assumed that women with a history of childhood trauma (CT) are more prone to adverse BE. Further, we expected that adverse BE would correlate with PPD. Finally, we explored whether the hypothalamic-pituitary-adrenal-axis was involved in the relationship of adverse BE and PPD by hair steroid analysis.

Methods: The sample consisted of twenty-one high-risk pregnant women (age: 33.09 ± 6.09 years) from the department of psychosomatics in obstetrics of a university hospital. At study recruitment (before the 32nd week of gestation), CT was assessed with the childhood trauma questionnaire (CTQ). At the 32nd week of gestation (t1), fear of childbirth (FOC) was measured using the Wijma delivery expectancy/experience questionnaire (W-DEQA), and antenatal depression was assessed with the Edinburgh postnatal depression scale (EPDS). Two days postpartum (t2), BE (W-DEQB) and depression (EPDS) were assessed. Twelve weeks postpartum (t3), participants rated their PPD (EPDS), and hair samples were collected to determine hair cortisol and cortisone concentrations reflecting glucocorticoid exposition during the first three months postpartum. The agreement or discrepancy between fearful expectation (FOC t1) and actual birth experience (BE t2) was calculated as their difference (delta FOC-BE).

Results: FOC and adverse BE correlated positively ($r(14) = .627, p = .009$). However, this association became non-significant after controlling for actual degree of depression ($p > .10$). Maternal CT did not correlate significantly with FOC ($p > .10$). However, there was a strong correlation between CT and adverse BE ($r(15) = .534, p = .027$). Adverse BE correlated positively with PPD ($r(15) = .701, p = .002$), and this relationship remained significant after controlling for depression at t2 ($r(12) = .577, p = .019$). Adverse BE itself did not correlate with hair cortisol or cortisone concentrations (both p 's $> .10$), but delta FOC-BE correlated negatively with hair cortisol and hair cortisone ($r_{\text{Spearman}}(13) = -.650, p = .009$; $r(13) = -.579, p = .024$, resp.). Hair cortisol, hair cortisone and delta FOC-BE did not correlate with PPD (all p 's $> .10$).

Conclusion: Although maternal childhood trauma does not affect anticipating fear of childbirth, it adversely affects subjective birth experience, and adverse birth experience in

turn seems to be a risk factor of postpartum depression. This pattern of results suggests that women with a history of childhood trauma are prone to reactivation of early experiences of neglect or maltreatment during the procedure of childbirth. These vulnerable women deserve more extensive psychosocial care during delivery in order to avoid re-traumatization and postpartum depression. Finally, even though hair steroids were increased in subjects who experienced their childbirth worse than they had expected, this finding was not directly correlated with development of postpartum depression. We conclude that the relationship between adverse birth experience and postpartum depression is rather due to early bonding experiences and reactualization of trauma than to the stress challenge per se.

Submission ID 56: Perceptions of mental health and attitudes towards seeking mental health services in Syrian refugees in Austria

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- **Abstract topic:** Post-traumatic stress disorder
- **Type of presentation:** Oral Presentation

Background. Pre-migration and in-transit, refugees are confronted with enormous physical and psychological stressors. Even after arriving in the destination country, psychological stress is high: Refugees repeatedly report post-migration living difficulties, e.g., ethnic discrimination, uncertainty of life, and fear of the future and deportation. Despite the comparably elevated rates of mental disorders amongst refugees, the diagnosis and treatment of psychological effects of flight have proven to be difficult. Among other factors, this is often due to refugee-specific factors influencing the perception of mental disorders (i.e., beliefs regarding the development and a lack of understanding of the symptomatology), the thematization of which is accompanied by cultural stigma. This study aimed to investigate the relationship between Syrian refugees' mental health, their perception of post-traumatic stress disorder (PTSD) and depression, and attitudes toward seeking mental health services using a qualitative and quantitative methodological triangulation strategy. We hypothesize that the illness perception of PTSD and depression, i.e., treatment control, personal control, illness coherence, influences the attitude toward seeking mental health services. Further, we hypothesize the relationship to be moderated by one's symptomatology. Methods. Adult refugees of Syrian origin with a maximum of 36 months' length of stay in Austria filled in questionnaires and took part in gender-homogenous focus groups. The semi-structured focus group interviews as well as parts of the questionnaire, were based on case vignettes. The vignettes described a fictional person suffering from symptoms of PTSD or depression since their flight, in line with DSM-5 and ICD-11 criteria. Bivariate correlation analyses were run to determine the associations between participants' mental health (PTSD Checklist for DSM-5, Patient Health Questionnaire 9 for depression), their perception of PTSD and depression (Illness Perception Questionnaire-Revised), and attitudes towards seeking mental health care (Inventory of Attitudes towards Seeking Mental Health Services). The contents of the focus group discussions will be analyzed using the qualitative content analysis by Mayring. Results. So far, 121 participants (12.4 % female, Mage= 32.2, Range = 18–60) have filled in the questionnaires, and two focus group discussions (N = 10, all male, Mage= 32.5, Range = 22–48) have been held. Bivariate correlation analyses of the preliminary data showed positive correlations between treatment control and indifference to stigma, $r(120) = .23$, $p = 0.01$, and help-seeking-propensity, $r(120) = .28$, $p = 0.02$, respectively. Further, a positive correlation between

illness coherence and indifference to stigma was found, $r(120) = .32$, $p < 0.001$. Personal control correlated significantly with help-seeking-propensity, $r(120) = .31$, $p < 0.001$, and with psychological openness, $r(120) = -.18$, $p = 0.005$. Moderation analyses showed that one's own PTSD symptomatology moderated the associations between treatment control and help-seeking-propensity, $\Delta R^2 = 11.01\%$, $F(3,110) = 7.10$, $p < .001$, 95% CI[-0.687, -0.206], and between personal control and help-seeking-propensity, $\Delta R^2 = 6.66\%$, $F(1,110) = 3.78$, $p = .013$, 95% CI[-0.063, -0.001]. By the time of the congress, the analyzed contents of the focus group discussions will be available. Conclusion. As the utilization of mental health services in the refugee population is low and often hindered by cultural stigma, the finding emphasizes the need for culture-sensitive psychoeducational programs on flight-associated mental disorders.

Submission ID: 57

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- **Abstract topic:** Social aspects of stress and anxiety
- **Type of presentation:** Oral Presentation

Thermoregulation of social stress – experimental findings

Objective

Social isolation is a key feature of some of the most frequent mental disorders and is often accompanied by feelings of social disconnection. As of yet, the physiological embedding of these feelings remains incompletely understood. However, empirical evidence suggests that it may be intertwined with the body's thermal system. The aim of our experiment was to investigate whether experimentally induced social disconnection activates physiological thermoeffectors and whether thermal cues modulate feelings of social disconnectedness.

Methods

To this end, n=80 healthy women recruited as part of an ongoing study were randomly allocated to a neutral or warm temperature condition. To induce feelings of social disconnection, all participants underwent the Yale Interpersonal Stressor Task (YIPS). Negative affect was measured before and after the YIPS. Heart rate, sweating, and skin temperature in different body locations were measured in a subsample, using state-of-the-art electrophysiological equipment.

Results

Our preliminary analyses revealed that heart rate as well as chest and wrist temperature increased significantly during social disconnection. Descriptively, the warm temperature group demonstrated an attenuated increase in stress and tension following social disconnection when compared to the neutral temperature group.

Conclusion

Should we continue to find evidence for socio-thermal links in the full sample, our findings will contribute to an improved understanding of the physiology of social disconnectedness. As such, they may pave the way for novel approaches to alleviate the suffering evoked by social isolation.

Submission ID: 58

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- **Abstract topic:** Neurobiology of anxiety and stress
- **Type of presentation:** Oral Presentation

Stress & early life adversity: Biobehavioral mechanisms predicting addiction relapse

Accumulative research suggests dysregulated stress response in those who have been exposed to high levels of early life adversity (ELA). ELA is a predictor of risk for various types of addictive behaviors. Changes in brain functions during development may contribute to this outcome through alterations in emotional regulation. We examined the link between psychophysiological and biological stress reactivity and early life adversity in those who already have demonstrated substance use dependence (I.e., nicotine dependence).

Multiple studies were conducted with smokers and nonsmokers. Smokers were smoking ad libitum or going through withdrawal, and were in the process of quitting nicotine use. Participants were classified on levels of their scores on Adverse Childhood Events. Participants attended two stress-lab sessions (ad libitum smoking and nicotine withdrawal). Hormonal, cardiovascular, and subjective measures were collected throughout the sessions.

We observed the following 1) individuals with high ELA showed greater adrenocorticotrophic hormone (ACTH), but lower plasma and salivary cortisol levels, than those with low ELA; 2) cortisol differences between high and low ELA were abolished during tobacco withdrawal; and 3) the appetite hormone, ghrelin, which modulates stress responses and the rewarding effects of drugs, was found to be associated positively with ELA in nonsmokers, but not in smokers.

Our results collectively indicate that ELA moderates stress-related biobehavioral changes, and this is evident during withdrawal. Mechanisms for this link may include altered emotional regulation and motivational state that are likely to contribute to maintenance of nicotine use and relapse.

Submission ID: 59

- **Authors:** *Tatyana Strekalova and Anthony, Daniel and Gorlova, Anna and Svirin, Evgeniy and Radford-Smith, Daniel and Sheveleva, Elisaveta and Berger, Gregor and Walitza, Susanne*
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- **Abstract topic:** Management of stress and anxiety
- **Type of presentation:** Oral Presentation

Omega-3 food supplement exerts anti-depressant and anti-anxiety effects in a mouse model of stress-induced juvenile depression

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Introduction: Depression is a devastating mental disorder that is increasingly diagnosed in adolescence. While the neurobiology of juvenile depression is believed to differ from that of depression in adults, indicating the need for specific prevention and treatment methods, there is a scarcity of animal models that mimic this condition.

Methods: In this study, we used the ultrasound (US) stress model, a form of "emotional stress," in juvenile C57/BL6 mice as a paradigm of stress-induced adolescent depression. Mice at one month old were exposed to unpredictably alternating frequencies of ultrasound for three weeks, ranging from 20-25 kHz and 25-45 kHz. These frequency ranges are known to correspond with emotionally negative and neutral states, respectively, for small rodents in nature. This exposure induced behavioral and molecular changes similar to depressive symptoms, including signs of oxidative stress. Additionally, a group of mice received a food supplement (FS) containing omega-3 (1.1 mg/kg/day), eicosapentaenoic acid (EPA; 0.55 mg/kg/day), and docosahexaenoic acid (DHA; 0.55 mg/kg/day) throughout the stress period. After the stress termination, the mice underwent a battery of tests to evaluate anxiety- and depressive-like behavior. We also examined their blood levels of CORT (corticosterone), brain expression of pro-inflammatory cytokines, malondialdehyde (MDA) brain concentrations, and conducted blood metabolome analysis.

Results: The US-exposed mice that received a placebo treatment showed decreased sucrose preference, indicating anhedonia, a key feature of depression. However, this decrease was not observed in the US-FS group. Consistent with these differences, the placebo-treated group displayed increased floating behavior in the forced swim test, elevated CORT and MDA levels, and enhanced gene expression of TNF and IL-1 β , while no such changes were

found in the US-FS animals. In both non-stressed and stressed mice, treatment with the food supplement decreased anxiety-like behavior and increased novelty exploration and general activity. Metabolome analysis revealed distinct changes in blood alanine and glutamate levels that correlated with stress exposure and FS treatment.

Conclusion: Chronic intake of the food supplement containing omega-3 counteracted depressive- and anxiety-like changes in a mouse US model of juvenile depression. These effects are likely due to the antioxidant and anti-inflammatory properties of the food supplement.

Submission ID: 61

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- **Abstract topic:** Phobias
- **Type of presentation:** Oral Presentation

Title: Influence of valproic acid combined with reactivation of fear memory on outcome of extinction-based therapy in patients with spider phobia

(1) Objective: Exposure to feared objects or situations is the most common and effective treatment for specific phobia and anxiety disorders in general. The proposed underlying mechanism of exposure therapy is extinction. During the extinction process new non-fear memory traces are generated to inhibit old fear memory traces. Although extinction effectively reduces the fear response in short-term testing, extinction gains are often not permanent. Return of fear is correspondingly a common problem in treatment of phobia and anxiety disorders in general. Therefore, new treatment approaches need to be developed that focus on the stability of treatment outcomes. Targeting reconsolidation processes after successful fear memory reactivation might be critical for stable fear reduction. Nevertheless, a translational study in patients with spider phobia found reactivation prior to exposure treatment not to be more effective than exposure treatment alone. Evidence from animal studies indicate that remote memories (as phobia-related fear memories) lose their plasticity but that the neuroplasticity can be reinstated with the application of inhibitors of histone deacetylases (HDACis) during reconsolidation and even remote memories persistently attenuated by a reactivation/extinction protocol. In the present study, we aim to translate the evidence from animal studies into a clinical application. The current study examines, if the combination of HDACis and reactivation before exposure treatment leads to reduced return of fear in patients with spider phobia.

(2) Methods: Patients with spider phobia receive in a randomized, double-blind design placebo or the HDACi valproic acid (500 mg) in combination with reactivation of remote

fear memory before a 30 minutes long exposure treatment. For exposure treatment, we use a virtual reality (VR) environment, which allows exposure in a standardized manner. Strength of phobic fear is evaluated by means of behavioral (behavioral avoidance test, BAT), subjective (self-report questionnaires, visual analogue scales) and psychophysiological (skin conductance, ECG, Startle) measures before and 3 months after exposure therapy in VR. We calculated linear models in combination with ANOVA (SSQ type 2).

(3) Results: We did not find an enhancement in approach behavior in the BAT at 3 months follow-up after exposure therapy in VR in the valproic acid plus reactivation group compared to the placebo plus reactivation group ($p > 0.05$), but a larger reduction in subjective measures of spider phobia ($p < 0.01$). Results from the psychophysiological measures will be presented at the meeting.

(4) Conclusion: A positive influence of a one-time application of valproic acid in combination with reactivation of remote fear memory before exposure treatment on the stability of fear reduction in subjective measures has potential for the treatment of specific phobias as well other anxiety and related disorders treated with exposure as for example addictive disorders. The reasons why there is no improvement on the behavioral level need further investigation.

Submission ID: 63

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- **Abstract topic:** Everyday life stress
- **Type of presentation:** Oral Presentation

Objective: Stress plays an important role in the development and maintenance of chronic, medically unexplained fatigue. However, not everyone who experiences chronic levels of stress becomes fatigued, indicating that inherent individual differences exist in the resilience and risk for stress related chronic fatigue. Here, we will present recent findings from a study investigating whether differences in stress sensitivity exist in individuals with varying levels of chronic stress and fatigue. Using a lab to life approach, we highlight the impact of stress and fatigue on salivary biomarkers of stress, in response to an acute laboratory stress induction paradigm as well as in everyday life. Methods: 46 women (40.8 ± 15 years) with varying levels of chronic stress and chronic fatigue were exposed to an in-lab psychosocial stressor. They then participated in a 14-day ambulatory assessment in their daily lives. Salivary biomarkers of stress, cortisol and alpha-amylase (sAA), were collected at multiple time-points during both components of the study. Fatigue was assessed using the multidimensional fatigue inventory, and chronic stress was assessed via the screening scale of the Trier inventory for the assessment of chronic stress. Results: The results revealed that increasing levels of chronic stress and fatigue were associated with blunted sAA and cortisol reactivity to stress in the lab, and blunted awakening and diurnal cortisol levels in daily life. Conclusion: Our findings demonstrate that the combined influence of chronic stress and fatigue impose a dysregulating effect on overall functioning of the stress systems, highlighting an important mechanism in the pathway to disease.

Submission ID: 64

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- **Abstract topic:** Stress-related and anxiety disorders
- **Type of presentation:** Oral Presentation

The ongoing opioid epidemic in the U.S. emphasizes the need for a better understanding of the neurobiological mechanisms underpinning opioid use disorder. Recent preclinical and clinical evidences suggest that the endocannabinoid system (ECS) plays a key modulatory role in stress response and reward behavior, both crucially involved in substance use disorder (SUD). Although recent animal models postulate a link between ECS and SUD, human translational studies are lacking. Here, we investigated plasma endocannabinoids (eCB) in chronic non-medical prescription opioid users (NMPOU) and its association with laboratory induced social stress. We compared 2-arachidonylglycerol (2-AG), anandamide (AEA), oleoylethanolamide (OEA), and palmitoylethanolamide (PEA) between chronic NMPOU (n=21) and healthy controls (n=29). Correlations between eCB levels and social stress, induced by social exclusion using the Cyberball task, were analyzed. We found significantly elevated AEA, OEA, and PEA plasma levels in NMPOU compared to controls, but no differences in 2-AG. Within NMPOU, higher AEA levels were associated with lower perception of social exclusion. Together with our recent findings of elevated basal 2-AG plasma levels in dependent cocaine users, present results indicate substance-specific alterations of the ECS suggesting different pharmaco-therapeutic targets within the ECS as novel treatments of SUD. Moreover, elevated AEA in NMPOU might show protective effects against social stress.

Submission ID: 70

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- **Abstract topic:** COVID-19, stress and anxiety
- **Type of presentation:** Oral Presentation

Title: Exposure to COVID-19-related hospitalization and death in a national sample of Swiss adolescents: prevalence and effects on anxiety and depression symptoms

Background: Exposure to COVID-19-related death and hospitalization is a likely source of stress for adolescents. The aims of this study were a) to examine Swiss adolescents' exposure to COVID-19-related hospitalization and death within their family and circle of acquaintances and b) that exposure's impact on adolescents' symptoms of anxiety and depression.

Methods: Longitudinal data was analyzed from a national Study of adolescents and their parents in Switzerland. Adolescents (12-17 years old) and one of their parent were surveyed in 2020 and in 2021. Exposures were parent-reported kin hospitalization and death due to COVID-19 and adolescent-reported death due to COVID-19 of someone they know. Outcomes were anxiety symptom severity as assessed by the brief version of the Spence Children's Anxiety Scale for Children (SCAS-C) and core depression symptom severity as assessed by the Patient Health Questionnaire (PHQ-2).

Results: The prevalence of parent-reported exposure to kin death or hospitalization was 1.8% (95% CI: 0.9, 3.0) in 2020 and 2.2% (95% CI: 1.1, 3.8) in 2021. The prevalence of adolescent-reported exposure to death of someone they know was 5.9% (95% CI: 4.2, 8.0) in 2020 and 11.5% (95% CI: 8.9, 14.4) in 2021. There was no statistical evidence of an effect of adolescent-reported exposure to death in 2020 on GAD or depression symptoms either cross-sectionally or longitudinally. Adolescents exposed to kin death or hospitalization in 2020 as reported by parents had increased levels of GAD symptoms in 2020 ($b = 1.48$, 95% CI: -0.930, 3.88, $p = 0.229$), although this difference fell short of statistical significance, possibly due to the small number of cases. Evidence of such an effect on GAD symptoms was no longer found in 2021.

Conclusions: Swiss adolescents' exposure to COVID-19-related hospitalization and death within family and circle of acquaintances in 2020 appeared not to be associated with

substantial effects on GAD or depression symptoms, suggesting resilience of adolescents at least in the first pandemic wave. Implications and limitations are discussed.

Submission ID: 71

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- **Abstract topic:** COVID-19, stress and anxiety
- **Type of presentation:** Oral Presentation

Title: The longitudinal association between parents' stress, children's stress and children's anxiety during the covid pandemic in Switzerland

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Objective. The COVID-19 pandemic has been both an acute and chronic threat to the well-being of the general population, due to the numerous challenges posed by social disruption, including social isolation, financial insecurity, and confinement-related stress (e.g., interruptions in daily routines, important events, and plans). Adolescents might be especially vulnerable to these challenges, since they are facing significant changes in all aspects of life. The present study aims to assess the longitudinal association of perceived covid-19 related stress, coping strategies and anxiety symptoms in adolescents and their parents during the first lockdown and one year after the lockdown.

Method. The present longitudinal study was conducted among a large national sample of adolescents 12-17 years old from all three language regions (German-, French-, and Italian-speaking) in Switzerland. The baseline (wave 1) was conducted from July-October 2020 through online survey. Its aims are to assess the impact of the first lockdown due to COVID-19 by reporting the prevalence of symptoms of mental illness and documenting the various stressful situations caused by COVID-19 perceived by adolescents and their parents. The follow-up survey was conducted one year later, from July-September 2021, employing the same measures to assess changes in mental health symptoms, perceived stress, and coping

strategies over time. About 553 children and adolescents participated both baseline surveys. A structural equation model (SEM) was fitted to examine the longitudinal association between perceived covid-related stress in 2020 and 2021 among adolescents and their parents, the adolescents' anxiety symptoms in 2020 and 2021 and coping strategy in 2020.

Results.

Parents' perceived covid-related stress during the lockdown is associated adolescents' perceived stress during the lockdown and both parents and adolescents' perceived stress one year later. Adolescent's perceived covid-related stress is associated with adolescents' anxiety symptoms during the lockdown and one year after the lockdown respectively. We also found longitudinal relationship that the anxiety symptoms in adolescents during the lockdown is associated with higher perceived stress and higher anxiety symptoms one year later. After controlling for all these association, adolescents' use of positive coping is associated with less anxiety symptoms in adolescents.

Conclusion

The results showed that perceived covid related stress are related between adolescents and their parents and are also associated with adolescents' anxiety symptoms longitudinally. The clinic and public implication will be discussed.

Submission ID: 72

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- **Abstract topic:** Stress-related and anxiety disorders
- **Type of presentation:** Oral Presentation

Self-help plays a pivotal role in the management of anxiety disorders. This presentation aims to shed light on the significance and relevance of self-help groups, with a particular focus on the collaborative efforts between the German Anxiety Help Association and individuals seeking support.

The effectiveness of self-help groups lies in the shared exchange of experiences and mutual support among individuals facing similar challenges with anxiety disorders. Through the exchange of coping strategies, personal stories, and information sharing, self-help groups empower participants to better understand their anxieties and develop effective coping mechanisms.

It is noteworthy that self-help is also presented in the S3 guidelines for anxiety disorders. These guidelines, developed by experts to provide evidence-based recommendations for the treatment of anxiety disorders, recognize the importance of self-help as a complementary approach. They emphasize the effectiveness and benefits of self-help groups for individuals and recommend their integration into treatment.

The German Anxiety Help Association actively contributes to the promotion of self-help. In addition to supporting the establishment of new self-help groups, the association advocates for the recognition of self-help groups as an essential component of anxiety disorder treatment. Moreover, the association provides training, informational materials, and peer counseling services to support individuals. The German Anxiety Help Association is also in the process of creating a brochure aimed at providing fundamental information about anxiety disorders for general practitioners and individuals, as well as developing a podcast to offer further support.

This presentation will underscore the significance and widespread prevalence of self-help groups, highlighting their recognition in the S3 guidelines for anxiety disorders.

Additionally, it will showcase the various offerings of the German Anxiety Help Association in promoting self-help and supporting individuals.

Submission ID: 73

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- **Abstract topic:** Management of stress and anxiety
- **Type of presentation:** Oral Presentation

Obsessions – how to identify, understand and cope with them

Introduction

People suffering from OCD may have obsessions, compulsions or both disturbing their daily life. Obsessions are unwanted, intrusive thoughts, images, or urges that cause distressing feelings. Compulsions are repetitive behaviours performed in a stereotyped manner to get rid of the thoughts or to decrease the distressing feelings. Common obsessions are the fear of contamination, the fear of acting on an impulse to harm oneself or others, the fear of being responsible for something terrible happening, excessive concerns about perfectionism or unwanted thoughts about sexuality and religion. In most cases, people realize that these thoughts are illogical, they try to resist and to suppress the thoughts or avoid situations triggering the obsessions. Compulsions can be performed in overt actions like handwashing or checking, but also in mental actions in form of arguing, counting or appeasing thoughts. In long term all kinds of compulsions lead to an increase of obsessions and an inhibition of emotional processing.

Target Audience

This workshop addresses people suffering from OCD, their relatives and everyone who wants to learn more about OCD with a focus on obsessions and mental compulsions.

Content of the Workshop

The participants learn how to identify obsessions and to discriminate them from normal thoughts and worries everyone knows. A cognitive-behavioral model of the development and maintenance of obsessions is presented. The participants are introduced in the reappraisal of obsessions and the reevaluation of cognitive thinking styles maintaining OCD as perfectionism, exaggerated responsibility and overestimation of danger, meaning and controllability of thinking. Cognitive-behavioural, imaginative and metacognitive techniques are demonstrated as well as the modification of exposure and response prevention for predominant obsessions and mental compulsions.

Submission ID: 74

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- **Abstract topic:** Social aspects of stress and anxiety
- **Type of presentation:** Oral Presentation

Social buffering in virtual reality and real life

Social interactions are part of the treatment of psychological and psychiatric disorders. Thus, understanding the role of social interaction in clinically relevant conditions is essential for optimizing treatments, and diagnosis. Animal research has shown that the presence of conspecifics can reduce basic physiological responses to negative events, known as social buffering. In a series of studies, we tested the potentials of social buffering for reducing basic physiological fear responses in humans. Our findings show that the mere presence of another person can decrease human physiological fear responses and that social buffering can also occur in the presence of a virtual person. The strength of these effects are modulated by the features of the challenged person, the features of the interaction partner, and the context of the social interaction. Taken together, these findings shed light on the effects of real and virtual social presence on human fear.

Submission ID 79: Posttraumatic stress disorder induced by cardiac disease

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- **Abstract topic:** Post-traumatic stress disorder
- **Type of presentation:** Oral Presentation

This presentation will provide an update on the current state of knowledge regarding cardiac disease-induced posttraumatic stress disorder (CDI-PTSD) with a focus on acute coronary events. Cardiovascular disease, particularly a life-threatening cardiac event, is often a highly stressful experience that can produce clinically significant symptoms of PTSD or PTSD meeting DSM-5 criteria, in patients, as well as in their caregivers, that take a chronic course if left untreated. There are several features that distinguish CDI-PTSD from "traditional" PTSD triggered by external trauma, namely persistent somatic threat, inability to avoid trauma-related cues, and hyperarousal about internal bodily sensations leading to a constant fear of recurrent cardiac events. CDI-induced PTSD symptoms are associated with an increased risk of recurrent cardiovascular events. This can be explained by pathophysiological changes, unhealthy lifestyle, and lack of adherence to treatment for cardiac disease. Currently, there is limited evidence on the prevention of CDI-PTSD, although a trauma-informed approach may be useful for its treatment. Treatment options for patients and caregivers and the long-term effects of trauma-focused interventions on physical and mental health should be future research directions.

Submission ID 80: AdoASSIP – a short intervention program for youth after suicide attempts. An observational descriptive analysis.

- **Authors:** *Gregor Berger* and *Isabelle Haeberling* and *Martina Preisig* and *Marianne Rizk* and *Martina Blaser* and *Konrad Michel* and *Dagmar Pauli* and *Susanne Walitza*
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- **Abstract topic:** Stress and anxiety in children and adolescents
- **Type of presentation:** Oral Presentation

AdoASSIP is a short term intervention to prevent suicide reattempts in adolescents after a suicide attempt (www.adoassip.ch). In an information pre-session patients and families are informed about the risk and benefits. The first session involves a video-recorded narrative interview about the history of the suicide attempt(s). In the second session parts of the narrative are watched together with a special focus on trigger events and basic needs. In-between the sessions the patients complete written homework around suicidality. The narrative together with the homework are put into a written lay case formulation that is addressed to the patient including his long-term goals, personalized warning signs and safety strategies and recorded in a smartphone app (Robin Z). Finally the adolescents present his case formulation to his parents and other significant others, e.g. his therapist. For the following two years outreach contacts at 3, 6, 9, 12, 18 and 24 months via e-mail, or text message shall consolidate the patients self-efficacy in dealing with future suicidal crisis. Based on over 80 AdoASSIP interventions to date, the intervention has a high level of acceptance.

Submission ID 81: How to deal with treatment resistant depression? Therapeutic drug monitoring, pharmacogenetics and rapid-acting antidepressants

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- **Abstract topic:** Depression
- **Type of presentation:** Oral Presentation

Major depression is a common disorder with a substantial burden for patients. There are effective antidepressants available, however, more than 50% of the patients do not respond to the initial administered antidepressant and about 30% fail to respond following several treatment attempts. Moreover, even patients in remission complain of some functional impairment, for example cognitive deficits. In addition, antidepressants may also induce undesirable effects, at least in about 25% of the patients taking antidepressants.

Currently, the selection of an antidepressant is based solely on clinical observations and experience of the physician, measurable data from behavioral or neurobiological systems are not considered. However, the understanding of the mechanisms underlying the metabolism and response to antidepressants has grown steadily which led to the development of either biomarkers that guide antidepressant treatment and also to the application of new and innovative antidepressants. Therapeutic drug monitoring (TDM) and pharmacogenetic tools already support the process of selecting and dosing antidepressants. Objectives for the use of TDM are uncertain drug adherence, non-response to therapeutic doses, pharmacokinetic drug-drug interactions or suboptimal tolerability. Especially for vulnerable patients groups, i.e. children, elderly patients or pregnant women, TDM improves the safety of drug administration. Pharmacogenetic testing identifies genetic variants that are associated with drug metabolism, i.e. genetic variants within the CYP450 enzymes such as CYP2C19 or CYP2D6. In fact, numerous expert panels, such as the Clinical Pharmacogenetics Implementation Consortium (CPIC) or the Pharmacogenomics Knowledgebase (PharmGKB) recommend the detection of these variants, for example by using commercially available tests. These approaches help to reduce the development treatment-resistant depression (TRD) and the occurrence of adverse drug reactions. With the rapid-acting antidepressant esketamine a new option for TRD emerged. Together with the psychedelic drug psilocybin a new era of antidepressant treatment is evolving.

Submission ID 82: Oxidative stress and inflammation in ADHD? Personalized in vitro modeling and treatments effects

- **Authors:** *Edna Grünblatt*
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- **Abstract topic:** ADHD
- **Type of presentation:** Oral Presentation

Attention-deficit hyperactivity disorder (ADHD) is a complex neurodevelopmental disorder due to the spectrum of geno- and pheno-types observed. Globally over 5% of children and adolescents are affected with 60% of these cases persisting into adulthood, leading to reduced life expectancies. While the underlying etiology of ADHD remains elusive, one reoccurring observation is becoming more relevant: the involvement of oxidative stress (OS) and inflammation. Studies indicate the association between elevated OS and ADHD. Moreover, increasing evidence suggests comorbidities related to allergic and autoimmune disorders as a risk factor, linking inflammatory processes to playing a crucial role in ADHD. However, no direct evidence exists to OS and inflammation in CNS of ADHD patients. Though the complexity of the disorder demonstrates modelling ADHD as challenging, the innovative discovery of reprogramming somatic cells to induced pluripotent stem cells (iPSCs) has allowed personalized research in-vitro, as the genetic background of patients' condition is preserved without ethical concerns, while still being able to model neuronal cells. In the presentation, the first preliminary results using ADHD iPSC-generated forebrain cortical neurons (FCNs) assessing inflammation and OS alterations will be discussed in light with current knowledge. Furthermore, the potential supplementation of omega-3 PUFA will be discussed in light of OS and inflammation.

Type of presentation: Onsite Poster

Submission ID 2: Does Music Benefit Stress Recovery?

- **Authors:** *Yichen Song* and *Nater, Urs*
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- **Abstract topic:** Management of stress and anxiety
- **Type of presentation:** Onsite Poster

Objective: This study aimed to explore the effect of music on stress recovery after a laboratory stressor using both subjective measurements and physiological indices.

Methods: One hundred and five healthy female participants underwent the Trier Social Stress Test before being randomly allocated to four groups: group 1 (n = 25) listened to researcher-selected relaxing music; group 2 (n = 27) listened to self-selected relaxing music; group 3 (n = 26) listened to the sound of rippling water; and group 4 (n = 27) remained in silence. During the recovery phase, Visual Analogue Scales (VAS) were used for subjective stress measurement, saliva samples were collected for cortisol and saliva alpha-amylase (sAA) analysis, and Movisens equipment was used to measure heart rate and skin conductance levels.

Results: During recovery, the change of VAS scores was significantly different among groups ($F(3, 101) = 2.81, p = 0.04, \text{partial } \eta^2 = 0.08$) and post hoc revealed that the control group recovered slightly better than the sound of water group ($t(101) = 2.54, p = 0.08, d = 0.70$); the area under the curve with respect to ground of sAA was significantly different ($F(3, 101) = 2.70, p = 0.049, \text{partial } \eta^2 = 0.07$) and the researcher-selected group recovered slightly worse than the self-selected group ($t(101) = 2.56, p = 0.07, d = 0.71$); the recovery time of heart rate was significantly different among groups ($H(3) = 14.53, p < 0.01$) and the researcher-selected group recovered significantly faster than the sound of water group (difference = 28.78, critical difference = 22.51). No difference was found in the cortisol recovery and skin conductance recovery among the four groups.

Conclusion: Despite empirical evidence of music being beneficial for stress reduction, music did not benefit stress recovery in the current study.

Submission ID 4: Elucidating the functional effects of omega-3 fatty acids as a treatment in ADHD against inflammation and oxidative stress

- **Authors:** *Natalie Monet Walter and Yde Ohki, Cristine Marie and Walitza, Susanne and Grünblatt, Edna*
- **Affiliation details: department, institution / hospital, city, state (if relevant), country:** Department of Child and Adolescent Psychiatry and Psychotherapy, Psychiatric University Hospital Zurich (PUK), University of Zurich, Zurich, Switzerland
- **Abstract topic:** ADHD
- **Type of presentation:** Onsite Poster

Elucidating the functional effects of omega-3 fatty acids as a treatment in ADHD against inflammation and oxidative stress.

Objective:

Attention-deficit hyperactivity disorder (ADHD) is the most frequently reported neurodevelopmental disorder, with a worldwide prevalence of ca. 5%, affecting children and adolescents. Inflammation and oxidative stress may play a crucial role in ADHD, indicated by elevated serum levels of IL-6 and TNF α cytokines as well as increased reactive oxygen species discovered in ADHD children. Therefore, the non-pharmacological treatment of omega-3 (ω -3) polyunsaturated fatty acid (PUFA) components, docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA), display potential candidates, as they take part in several biological processes, including the attenuation of inflammation and oxidative stress. However, the underlying molecular mechanisms of ω -3 PUFAs involved in ADHD remains unknown.

Methods:

We aim to investigate pro-inflammatory cytokine release and oxidative stress in human induced pluripotent stem cell (iPSC)- derived forebrain cortical neurons (FCNs) from ADHD patients and healthy individuals as control. IL-6 and TNF α released in FCN supernatant with and without inflammatory stimulation are investigated using the Lumit assay kit provided by Promega. Furthermore, DHA (10 μ M) and EPA (10 μ M) treatment will be applied to evaluate anti-inflammatory effects. Mitochondria demonstrate the main source of reactive oxygen species production. Therefore, further analysis of detecting mitochondrial DNA copy number variation will be observed by performing qPCR in addition to MitoSox analysis marking superoxide's produced by mitochondria in FCNs, to identify the presence of mitochondrial disturbances in ADHD.

Results:

Preliminary results indicate increased IL-6 secretion in ADHD cell lines with and without inflammatory stimulation. However, further analysis is required for more reliable results. Moreover, ADHD cell lines were discovered to produce significantly more superoxide's compared to controls (Mann-Whitney, *p=0.0286). These alterations will be further assessed with ω -3 PUFA treatments.

Conclusion:

Preliminary results of IL-6 release in iPSC-derived FCNs may already suggest altered regulations in inflammatory responses. Furthermore, the investigations of superoxide's produced in FCNs suggests the involvement of mitochondrial induced oxidative stress in ADHD. Therefore, inflammation and oxidative stress may be a crucial contributor to the ADHD phenotype. Alas, our findings will help understand the importance of inflammation and oxidative stress more evidently and furthermore may reveal the functional effects of ω -3 PUFA to be considered as an additional treatment approach in ADHD in a personalized manner.

Submission ID 5: Involvement of the Wnt signalling in Methylphenidate (Ritalin) treatment of Attention-deficit hyperactivity disorder

- **Authors:** *Cristine Marie Yde Ohki* and *Walter, Natalie Monet* and *Walitza, Susanne* and *Grünblatt, Edna*
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- **Abstract topic:** ADHD
- **Type of presentation:** Onsite Poster

Involvement of the Wnt signalling in Methylphenidate (Ritalin) treatment of Attention-deficit hyperactivity disorder

Objective: Attention-deficit hyperactivity disorder (ADHD) is one of the most common neurodevelopmental disorders in children and adolescents affecting over 5% of the population worldwide. Methylphenidate (MPH), the first line treatment for ADHD with high effect sizes, seems to ameliorate brain maturational delays in ADHD patients. However, molecular mechanisms involved in this process remains elusive. Genetic studies indicate a possible involvement of the Wnt signalling in ADHD, given that this pathway plays a fundamental role in neurodevelopment, orchestrating cellular processes, such as proliferation, differentiation and maturation. In this study, we aim to investigate whether MPH modulates Wnt signalling in patients, which might ameliorate impaired neurodevelopment observed clinically.

Methods: ADHD patients responding to MPH treatment and matching controls (6-18 years old) were recruited by the Department of Child and Adolescent Psychiatry and Psychotherapy, University of Zurich. Peripheral Blood Mononuclear Cells (PBMCs) or plucked hair-derived keratinocytes from probands were reprogrammed via Sendai virus into iPSCs. Subsequently, NSCs were derived, as well as forebrain cortical neurons (FCNs). Reporter assays were performed in NSCs to analyse Wnt activation after treatment with Wnt-agonists, the antagonist DKK1, and MPH, to compare ADHD and controls. Growth rates of NSCs were also measured via xCELLigence/Wst-1 assays. Functionally, FCNs were tested regarding synaptogenesis in ADHD and controls via immunocytochemistry. ADHD and control groups were compared before and after MPH treatment.

Preliminary results: In proliferation analysis, ADHD NSCs proliferated significantly less than

controls for both xCELLigence (Mann Whitney, *p=0.0147) and Wst-1 assays (Welch's t test, **p=0.0082). Moreover, we found a significant negative correlation between growth rates and genetic predisposition to ADHD (Spearman correlation coefficient 0.432; *p=0.035). Increased active β -catenin and decreased levels of inactive GSK-3 β (Welch's t test, *p=0.0333 and ****p<0.0001, respectively) in ADHD via proteomic analysis indicated Wnt signalling alterations in NSCs. Functional reporter assays showed that EC50 values for the agonist Wnt3a were significantly lower in ADHD (Welch's t test, *p=0.033) concomitantly to increased IC50 values for DKK1, while MPH did not alter this phenotype. Tendencies of decreased number of synapses were found in ADHD FCNs.

Conclusion: Our preliminary findings point that growth rates are deregulated in ADHD NSCs in a genetic predisposition manner, being restored after MPH treatment. Additionally, Wnt signalling activity seems to be higher in ADHD. In this context, MPH increases Wnt activity at the highest concentration in both groups. Regarding synaptogenesis, synaptic connectivity tends to be impaired in ADHD FCNs. These results might be associated with brain maturational delays clinically observed in patients and with the MPH-induced improvements in these delays. Overall, our further findings will facilitate the understanding of the effects of MPH treatment in ADHD in cellular phenotypes and elucidate its effects on Wnt activity in patient-specific neural cell models, broadening possibilities to new approaches, preventive measures and therapeutic targets.

Submission ID 6: Perceived Stress, Depressive Symptoms, and Objectively Measured Instagram and WhatsApp Use Over Time: A Cross-Lagged Panel Model Approach

- **Authors:** *Nana Löchner and Dmitri Rozgonjuk and Cornelia Sindermann and Christian Montag*
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- **Abstract topic:** Everyday life stress
- **Type of presentation:** Onsite Poster

Perceived Stress, Depressive Symptoms, and Objectively Measured Instagram and WhatsApp Use Over Time: A Cross-Lagged Panel Model Approach

Previous studies have shown that social media (e.g., Instagram and WhatsApp) use is associated with perceived stress and depressive symptoms. However, most of these studies are relying on cross-sectional self-reported data. Moreover, there is little research looking at objectively measured social media use in the context of psychological well-being in everyday life, as acquiring these data is highly resource-demanding. In addition, literature on the mediating role of depressive symptoms in the association between perceived stress and objective social media use – especially across time – is lacking. This study aimed to investigate cross-lagged panel models with perceived stress and objective social media (specifically, Instagram and WhatsApp) use, and the role of depressive symptoms as a potential mediator. We employed longitudinal smartphone tracking across 8 weeks in combination with weekly measures of perceived stress and depressive symptoms among 179 participants. Preliminary analyses revealed that objectively measured social media use (both Instagram and WhatsApp) is not strongly correlated with perceived stress and depressive symptoms – especially over time. These study results are in accordance with some previous research findings, that have demonstrated weak associations between tracked social media use and psychopathology variables. This highlights the importance of employing not only self-report but also objective measurement methods. Although, several studies relying on self-reports have linked stress and depression to social media use, our results with tracking data draw a different picture. Additionally, the longitudinal design of the present study provides more plausibility for the causal inference with regards to the relationships between social media use, perceived stress, and depressive symptoms.

Submission ID 8: Investigating the trajectories of exposure to different forms of early life stress: Findings in young adults with previous youth residential care placements

- **Authors:** *David Bürgin* and *Laura Gurri* and *Cyril Boonmann* and *Nils Jenkel* and *Marc Schmid*
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University Psychiatric Hospitals Basel

- **Abstract topic:** Stress and anxiety in children and adolescents
- **Type of presentation:** Onsite Poster

Investigating the trajectories of exposure to different forms of early life stress: Findings in young adults with previous youth residential care placements

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Background: Young people placed out-of-home report high-rates of early life stress (ELS), including exposure to trauma, maltreatment, and further adversities (Osgood et al., 2010; Rebbe et al., 2017). Recent stress models highlight the need to assess the timing, duration, and severity of specific stressors (Epel et al., 2018). Previous work has shown distinct trajectories of incidences to different forms of ELS in healthy community sample (Teicher & Parigger, 2015). Little, however, is known about trajectories of different forms of ELS in previously out-of-home placed young people.

Objective: We aimed to report the prevalence of different forms of ELS across childhood (6y; 6-12y, 12-18y) and gender-differences for the severity of ELS in a sample of young adults with previous youth residential care placements in Switzerland. Further we explored trajectories of exposure to ten different forms of ELS from birth to coming of age and assessed the timing and interrelation of exposures.

Methods: We used the Maltreatment-and-Abuse-Chronology-of-Exposure (MACE-X) scale to assess ELS in 184 young adult Swiss care-leaver (Mage = 26.6, 33.2% women). The MACE-X allows to retrospectively examine exposure to ten different types of abuse and neglect throughout childhood. Importantly, this scale measures the specific years of exposure to each form of ELS.

Results: Overall, 87.5% of participants reported at least one type of ELS before reaching the age of 18 (61.4% in early childhood, 76.1% in middle childhood, and 72.8% in adolescence). Focusing on the severity of ELS, highest scores were found at the transition to adolescence around the age of 12, with women showing higher scores than men throughout childhood within our sample. Different forms of ELS showed distinct trajectories across childhood. For instance, emotional and physical neglect showed the highest stability from early childhood onwards, whereas witnessing intra-familial violence peaked in middle childhood around age 8, and peer victimization was most prevalent in early adolescence around the ages of 12 to 14. Many but not all investigated types of ELS were found to be medium to highly correlated, showing the complex patterning of co-occurring forms of stressors early in life within high-risk samples.

Conclusion: ELS is common in children and adolescents placed out-of-home, underlining the need for prevention and early intervention targeted towards healthy family-functioning and aiming to reduce toxic levels. For prevention and interventional efforts, it is crucial to be aware of potential gender-differences, of different trajectories of specific subtypes, and of the patterning of different types of exposures. Building capacity and resilience in out-of-home placed children and adolescents is crucial to prevent the development of stress-related disorders.

Submission ID 9: A Systematic Review on the Effects of Stress in the ADHD Brain

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- **Abstract topic:** ADHD
- **Type of presentation:** Onsite Poster

Objective: Attention-Deficit Hyperactivity Disorder (ADHD) is a highly prevalent neurodevelopmental disorder characterized by excessive socially disruptive behavioural mannerisms and is associated with decreased life quality in patients along with a high societal disease burden (1,2). ADHD etiology is influenced by a combination of genetic and environmental factors, resulting in neurological alterations in patients (3). Stress is a known risk factor for numerous psychopathologies, whereas evidence is lacking regarding the specific consequences of stress on the neural basis of ADHD (4–6). A systematic literature review (SR) was thus performed to clarify the role of stress in the association between the resulting alterations of brain structure, connectivity, and function in ADHD.

Methods: The SR was conducted following PRISMA guidelines and the protocol was registered in the International Prospective Register of Systematic Reviews (PROSPERO) (identifier: CRD42023379809) (7). A systematic search of the PubMed and CINAHL databases was conducted for articles published up to December 22nd, 2022. Retrieved literature was screened in Rayyan and data extraction was performed with respect to neuroimaging, stress exposure, and ADHD outcomes (8). The Quality in Prognosis Studies (QUIPS) tool was adapted based on the Conducting Systematic Reviews and Meta-Analyses of Observational Studies of Etiology (COSMOS-E) guidance article to assess risk of bias and quality of studies (9).

Results: 19 eligible studies from 25,026 non-duplicate screened articles were included. Quality assessment showed poor study quality with respect to sample size, study design, ADHD assessments, and the statistical approaches with respect to our research question. Results ranged from small to medium in effect size, while not all studies yielded significant evidence due to low sample size. Exposure to early life trauma, institutionalization, very low birth weight, prenatal exposure to smoking, alcohol consumption, and air pollution were related to impaired brain function, connectivity, and structural alterations in ADHD by use

of fMRI, MRI, and EEG.

Conclusion: Numerous novel findings could be presented, although the findings require replication in larger populations, especially in a longitudinal format. Obtaining clear results regarding how deviations from a healthy (childhood) environment lead to neurological changes in ADHD is rather complex. As such, much room remains for further research, while based on existing evidence, suggestions for future studies include assessing a variety of stress exposure conditions using a wider range of neuroimaging tools. Future studies may provide further invaluable information when it comes to tailoring prevention and treatment strategies and should be pursued and integrated into a more comprehensive understanding of ADHD.

Submission ID 11: The impact of self-efficacy and stress on intention and implementation of a respiration focused training to help others during stress

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- **Abstract topic:** Management of stress and anxiety
- **Type of presentation:** Onsite Poster

„The impact of self-efficacy and stress on intention and implementation of a respiration focused training to help others during stress“

Respiration is intricately connected to emotional experiences such as anxiety and stress, and is closely associated with overall well-being. Training programs incorporating brief periods of focused respiration have shown promising results in helping individuals, leading to alterations in respiration pattern variability (RPV) during stressful situations. We have developed a respiration-focused training program called Deliberate Breathing Training (Bewusstes AtemTraining, BAT), which targets various aspects of RPV. The primary objective of this training is to enhance individuals' ability to better manage negative emotions in challenging circumstances.

However, the mere intention to engage in techniques or programs beneficial to one's physical and mental health does not always translate into actual implementation of those intentions. Therefore, we evaluate the impact of self-efficacy and perceived stress levels among our participants on the actual utilization of the breathing exercises related to helping themselves and others with the exercises. So far, 50 participants have already completed our Peer-training successfully (learning to support themselves as well as others with it), which involves a minimum time commitment of 10 hours over the course of three weeks and primarily utilizes two breathing techniques: passive expiration and rescue breath.

Participants completed questionnaires assessing mood, anxiety, stress, bodily symptoms, intention to help others with the training, and actual implementation of helping others at a

three-week follow-up. In addition, an ambulatory assessment was conducted using a training app, which recorded training time and collected self-reports on mood and anxiety. The people who were helped by our participants during a moment of stress were also asked to provide feedback online regarding the guidance they received by our trainers.

We examine both the extent to which individuals effectively employ the techniques for regulating their own stress as well as their proficiency in assisting others through the peer-focused component of the training. By exploring the factors that facilitate or impede the intention-behavior gap in actively aiding oneself and others, we aim to shed light on the underlying mechanisms involved, better understanding the self-help as well as the helping behavior component of our respiratory focused training.

Submission ID 16: Neurexan Reduces Stress-Induced Hyperactivation in the Brain and Body - Results From a Placebo-Controlled, Crossover Trial in Mildly to Moderately Stressed, Healthy Individuals

- **Authors:** *Stephan Duller and Krylova, Marina and Herrmann, Luisa and Mayer, Kathrin and Nanni-Zepeda, Melanni and Alizadeh, Sarah and Chand, Tara and Izyurov, Igor and Li, Meng and Danyeli, Lena and Jamalabadi, Hamidreza and Boden, Cindy and Fan, Yan and Kasties, Vanessa and van der Meer, Johan and Vester, Johannes and Engert, Veronika and Seilheimer, Bernd and Schultz, Myron and Naschold, Britta and Duller, Stephan and Walter, Martin*
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- **Abstract topic:** Management of stress and anxiety
- **Type of presentation:** Onsite Poster

Neurexan Reduces Stress-Induced Hyperactivation in the Brain and Body - Results From a Placebo-Controlled, Crossover Trial in Mildly to Moderately Stressed, Healthy Individuals

Objective: Stress represents an acknowledged risk factor for health and affects all systems of the human body. Strategies for an early intervention in the build-up of the allostatic load with accumulating acute stress events or everyday stress include psychotherapy, behavioral therapy, stress reduction programs, but also drugs such as Neurexan. Neurexan is a natural medicinal product composed of herbal extracts of oat, coffee, passionflower, and a mineral salt at low concentrations. Stress-relieving effects of Neurexan were previously observed in patients suffering from insomnia and nervous restlessness as well as in several experimental studies. In an experimental setup, we tested Neurexan for its acute effects on various stress related responses.

Methods: Neuronal correlates of Neurexan were evaluated in an exploratory clinical trial (NEURIM; NCT02602275). In this randomized, placebo-controlled, double-blind, two-period, two-treatment crossover trial, a total of 40 healthy males with mild to moderate chronic stress were included. Participants received a single dose of three tablets Nx4 or placebo on each of the two study days (Day 1 and Day 2). On each of the two study days, several EEG, fMRI and psychosocial tests were performed: At baseline, a resting state measurement was conducted during a simultaneous EEG/fMRI scan session. After administering Nx4 or placebo, two computerized tests, the Attention Modulation by Salience Task (AMST), and an auditory oddball task were performed while EEG data was acquired. A second EEG/fMRI scan session was conducted, starting 40 to 60 minutes after dosing, including an initial resting state session followed by the Hariri emotional face-matching task, an expectancy task, the ScanSTRESS paradigm (psychosocial stress induction) as well as another resting-state session.

Results: At a pre-stress state, before the experimental stress induction, we showed that Nx4 reduced the susceptibility to distraction in an attention modulation task, modulated task free resting state functional connectivity related to emotion regulation, and reduced the amygdala activation in response to negative emotional stimuli. During the experimental stress paradigm, we observed a reduced activation of the anterior cingulate cortex under Neurexan in response to psychosocial stress induction. And then later in the post stress resting state, Neurexan dampened the activation of neural stress network in high trait anxiety individuals, ameliorated changes of heart rate variability and EEG oscillations, and improved vigilance regulation.

Conclusion: The data add evidence to the hypothesis that Neurexan exerts its efficacy on various stress related functions such as attention modulation, emotion regulation, neuronal stress network activation, and vigilance regulation. These data may help the clinician in the management of stress symptoms and daily hassles.

Submission ID 17: Long-Term Dysregulation in Stress Reactivity in Victims of Political Repression

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- **Abstract topic:** Biomarkers of stress and anxiety
- **Type of presentation:** Onsite Poster

Background. State organized psychological repression in the German Democratic Republic (GDR; 1949 – 1990) included “quiet” measures, such as wiretapping, spreading of rumours, or provoking failures in professional and social domains. Goal of these measures was to systematically undermine the psychosocial integrity of a political opponent, and induce anxiety, social isolation and confusion. These experiences of severe chronic stress have been shown to have a negative health impact on those affected, even many years later. The present study aims to unfold the physiological mechanisms potentially causing these psychological and physiological long-term consequences. Specifically, we focus on physiological stress reactivity of victims of political repression.

Methods. 60 participants (30 with repression experiences, 30 control, age range 50-80) participate in a modified version of the Trier Social Stress Test (TSST). We measure salivary cortisol and subjective stress at nine time points throughout the testing session.

Results. Results are currently pending.

Conclusion. Understanding how severe stress experiences influence body and mind in the long term is relevant not only for the rehabilitation of past victims, but is essential for the care of current and future victims of political repression in authoritarian regimes.

Submission ID 18: Stress and Anxiety: The Physiotherapy Perspective

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- **Abstract topic:** Management of stress and anxiety
- **Type of presentation:** Onsite Poster

(1) Objective setting:

Stressors are perceived and processed on a neurophysiological level. Various neurophysiological reactions are triggered in the brain. Perception and reactions can be influenced by physiotherapy techniques. –

(2) Methods:

Review of current literature and collection of practical experience from professional colleagues:

Treatment options are identified and neurophysiological explanations for the effect of physiotherapy treatments on mental disorders are provided. The review is based on the scientific literature up to July 2023.

The collection of case studies shows the broad spectrum in clinical practice. –

(3) Results:

There are a number of complementary therapies for stress and anxiety disorders that can be used in physiotherapy. Neurophysiological processes explain the mechanisms of physiotherapy interventions in stress and anxiety disorders:

Therapeutic effects can be explained by changes in long-term potentiation at synapses, by restoring balance in the stages of the autonomic nervous system and by influencing the hypothalamic-pituitary-adrenal (HPA) axis.

Non-verbal communication has an essential function; all of the at least nine non-verbal

modalities must be included. However, it is crucial that therapy is person-centred, holistic and adapted to the context and current situation. –

(4) Conclusion:

Patients with stress and anxiety disorders can also be treated in physiotherapy within an interdisciplinary setting.

The use of physiotherapy in patients with stress disorders can support their recovery.

Submission ID: 19

- **Authors:** *Vanessa Nieratschker and Annika Bender and Ariane Wiegand and Kristina Fuhr and Anil Batra*
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- **Abstract topic:** Genetics and epigenetics of anxiety and stress
- **Type of presentation:** Onsite Poster

Genetic and Epigenetic Effects associated with Hypnotherapy on Agoraphobic Patients

Mental disorders have devastating effects on patients, families, and society as a whole. In addition, the number of individuals in need of psychiatric care is increasing. However, treatment options available today are not optimal for many patients, and therefore need to be improved considerably. One important factor contributing to the relatively low efficacy of therapeutic interventions is the disregard of inter-individual differences between patients that influence therapy response. The development of a more personalized treatment concept in psychiatry requires the identification of markers and predictors of therapy response which will help physicians to choose the right treatment option for an individual patient. In the study presented here, we explored the potential of DNA methylation (DNAm) of the promoter region of the Catechol-O-methyltransferase (COMT) gene as a biomarker for hypnotherapy (HT) efficiency in agoraphobic patients. Additionally, the Val108/158Met polymorphism in the COMT gene (rs4680) was investigated to evaluate genotype differences in DNAm and symptom reduction. The analyses were conducted in saliva samples ($n = 17$) collected before (pre), immediately after (post) and three months after (follow-up) HT intervention. The mean Panic and Agoraphobia Scale (PAS) score decreased significantly from pre to post ($F(1,16) = 5.86, p = 0.03$), while PAS score comparison of all time points revealed a reductive trend ($F(2,18) = 3.11, p = 0.069$), suggesting a symptom reduction in patients receiving HT. While DNAm did not differ significantly between the assessed time points, the Val108/158Met genotype had a significant main effect on DNAm ($F(2,14) = 8.15, p = 0.004$), as well as on PAS score comparing both, pre and post only ($F(1,14) = 5.69, p = 0.032$), and all three time points ($F(2,7) = 7.65, p = 0.017$). Our results do not confirm COMT DNAm as biomarker for HT outcome, however, they indicate a potential influence of the Val108/158Met genotype on HT efficacy in agoraphobic patients. To confirm those results, replication in a larger cohort with balanced numbers of participant genotypes is necessary.

Submission ID: 21

- **Authors:** *Nadine Skoluda and Ali, Nida and Nater, Urs M.*
- **Affiliation details: department, institution / hospital, city, state (if relevant), country:** Department of Clinical Psychology and Health Psychology, Faculty of Psychology, University of Vienna, Vienna, Austria
- **Abstract topic:** Measurement of stress and anxiety
- **Type of presentation:** Onsite Poster

Title: TSST-Home – an experimental paradigm to induce psychosocial stress in the home setting

Objective: The Trier Social Stress Test (TSST) is a well-established laboratory paradigm aimed to elicit acute stress responses. However, its implementation requires a research environment with dedicated personnel (usually at a research institution). In the case of participants not being able to travel to a research institution (due to age, disability, or geographical location), a home version of the TSST is needed. We have developed the TSST-Home which shares the essential characteristics with the laboratory version, but is distinguished by its highly ecologically valid setting.

Methods: For the validation of the efficacy of the TSST, we aim to study thirty healthy male participants (18-35 years) who will be exposed to the TSST-Home and a placebo (control condition) in a randomized order. Participants will be asked about their subjective stress levels as well as various stress biomarkers (salivary cortisol, salivary alpha-amylase, heart rate, and electrodermal activity) will be assessed during the experiment. Furthermore, participants will also answer questions about their living conditions, and how they experienced the experiment set up in their homes.

Results and Conclusion: Given that data collection is currently ongoing, the detailed study protocol, as well as preliminary results will be presented at the conference.

Submission ID: 22

- **Authors:** *Nicolas Singewald* and *Sartori, Simone B* and *Rooney, Sinead* and *Ugursu, Bilge* and *Wolf, Susanne A* and *Sah, Anupam* and
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- **Abstract topic:** Neurobiology of anxiety and stress
- **Type of presentation:** Onsite Poster

Therapeutic interventions targeting brain neuroinflammatory alterations associated with high trait anxiety

Neuro-inflammation is discussed to play a pathogenetic role in specific subgroups of different psychiatric disorders including anxiety disorders. We have previously shown that a mouse model of trait anxiety (HAB) displays enhanced density and phagocytic activity of microglia (the resident myeloid immune cells of the CNS) in key brain regions of anxiety/stress circuitries as compared to their normal-anxiety controls (NAB). Here, we demonstrate that positive environmental stimuli in form of housing in an enriched environment (EE) when presented during adulthood reduces the innate hyperanxiety of HABs in different anxiety tests. The EE-induced anxiolysis coincided with an attenuation of enhanced microglial density and phagocytic activity in the DG and/or medial prefrontal cortex as indicated by a reduced number of microglia co-expressing Iba1+ and CD68+. The local infusion of the anti-inflammatory drug minocycline reduced microglial activation within the DG and attenuated enhanced anxiety in HABs providing a causal link between anxiety and microglia densities. Together with our previous findings, these results indicate that beneficial environmental changes have the capacity to alleviate hyper-anxiety in individuals predisposed to trait anxiety via dampening neuro-inflammatory events representing potential biomarkers for specific anxiety disorder subgroups. Future studies aimed at understanding how EE exerts such anti-anxiety effects via the activated microglia system could also hold the key to developing more targeted and personalized pharmacological treatments for anxiety disorders.

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Submission ID: 26

- **Authors:** *Teresa O'Rourke and Probst, Thomas and Pryss, Rüdiger and John, Dennis*
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- **Abstract topic:** COVID-19, stress and anxiety
- **Type of presentation:** Onsite Poster

Title: Exploring the time trend of perceived stress during COVID-19: An Ecological Momentary Assessment study with the mHealth application Corona Health

Objective: The main objective of this study was to investigate the time trend of perceived stress during the COVID-19 pandemic in a sample of German adults. Another aim was to identify possible moderating factors, to improve our knowledge on risk and protective factors over the course of the COVID-19 pandemic in Germany.

Methods: An ecological momentary assessment study with the mHealth application Corona Health was conducted with 288 participants from January 2021 to January 2022. Participants were asked to fill out the Perceived Stress Scale (PSS-10) weekly, resulting in 1882 total assessments with a mean of 6.33 assessments per participant. Linear multilevel models were conducted with SPSS to test possible moderating effects of various demographic factors as well as COVID status on the time trend of stress during the COVID-19 pandemic.

Results: Perceived stress significantly decreased over time in the total sample. Younger age, female gender, and using an Android operating system were all significantly associated with increased overall stress. Being in a registered same-sex relationship was significantly associated with higher perceived stress, while being widowed was significantly associated with less perceived stress. However, none of the assessed variables significantly moderated the time trend of perceived stress. Unexpectedly, neither having a COVID diagnosis nor a family member with a COVID diagnosis was significantly associated with perceived stress in this sample.

Conclusion: While perceived stress significantly reduced over time in the total sample, certain groups seem to have experienced higher stress levels during the COVID-19 pandemic. Our results emphasize the findings of various studies showing that women and younger people were particularly burdened during the COVID-19 pandemic and highlight the need for public health measures to prevent negative stress-related (mental) health outcomes in these risk groups.

Submission ID 28: Physiological Stress Reactivity and Self-Harm: A Meta-Analysis

- **Authors:** *Andreas Goreis and Prillinger, Karin and Bedus, Carolin and Lipp, Ronja and Mayer, Anna and Nater, Urs M and Koenig, Julian and Plener, Paul L and Kothgassner, Oswald D*
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- **Abstract topic:** Biomarkers of stress and anxiety
- **Type of presentation:** Onsite Poster

Objective: Self-harm is associated with alterations in the psychobiological stress response. Specifically, the reactivity of the autonomic nervous system (ANS) and the endocrine hypothalamic-pituitary-adrenal (HPA) axis may differ in individuals who engage in self-harm. However, evidence in this regard is inconsistent.

Methods: We conducted a preregistered random-effects meta-analysis of sympathetic ANS, parasympathetic ANS, sympathetic-parasympathetic, i.e., mixed-influence ANS, and HPA axis reactivity following laboratory stress exposure in individuals who engage in self-harm and controls. Stress exposure consisted of paradigms using either social-evaluative (e.g., TSST), emotional (e.g., negatively valenced visual stimuli), or physical (e.g., cold pressor test) challenges. A total of 30 studies (self-harm: $n = 1,039$, controls: $n = 1,175$, 75% females) were included in the analysis.

Results: Regarding ANS reactivity to stress, no differences emerged between the two groups. However, parasympathetic ANS activity was lower before stress ($g = -0.30$, CI -0.48 – -0.12) and after stressor cessation ($g = 0.54$, CI -1.07 – -0.01) in the self-harm group compared to controls. Regarding HPA axis reactivity, individuals who engage in self-harm showed significantly lower cortisol responses to stress than did controls ($g = -0.29$, CI -0.44 – -0.14). After stressor cessation (i.e., during stress recovery), cortisol was also lower in individuals who engage in self-harm compared to controls ($g = -0.22$, CI -0.37 – -0.07).

Conclusion: Lower basal parasympathetic ANS activity and flattened cortisol responses indicate dysregulation of psychobiological stress systems in individuals who engage in self-harm. A better understanding of the psychobiological underpinnings of self-harm may allow for the establishment of biomarkers of risk stratification and treatment monitoring in affected individuals.

Submission ID: 29

- **Authors:** *Oswald Kothgassner and Goreis, Andreas and Pfeffer, Bettina and Hajek Gross, Carola and Plener, Paul*
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- **Abstract topic:** Stress-related and anxiety disorders
- **Type of presentation:** Onsite Poster

Title: What are you looking at? Attentional bias and stress reactivity to NSSI-related online content in adolescents with and without non-suicidal self-injury

There is an ongoing debate about to what extent online content related to non-suicidal self-injury (NSSI) can elicit autonomic stress responses and an urge to NSSI; however, there is only very scarce evidence that NSSI-related online content directly triggers actual NSSI behavior. Moreover, there is a strong need to understand basal processes of attentional biases in individuals with NSSI and how this contributes to NSSI-related thoughts and behaviors.

According to the vigilance-avoidance model, we hypothesized that individuals with NSSI will shift their attention toward NSSI-related stimuli and NSSI-related content will elicit an autonomic stress response and a real urge to NSSI after exposure.

We used eye-tracking, skin conductance response (SCR) and heart rate (HR) assessments for an experimental approach exposing 50 participants (25 individuals with NSSI, 25 without a history of NSSI) to NSSI-related online content (pictures of wounds, scars, words related to self-harm). We had 64 trials of stimuli sets (50% NSSI-related, 50% neutral). Each trial consisted of four simultaneous discrete visual stimuli presented in different spatial locations of a computer for 500 and 1000 milliseconds.

We will report our results regarding attentional bias, stimuli avoidance and autonomic stress reactivity (HR, SCR), as well as their urge to NSSI after exposure to the stimuli. There was no difference between the groups regarding autonomic stress reactivity. However, some individuals with NSSI reported a higher baseline stress level and also showed higher autonomic stress levels throughout the experiment. Additionally, individuals with NSSI had faster initial fixations and longer fixation durations on NSSI-related stimuli, significantly associated with an elevated urge to NSSI after exposure.

We will discuss the implications of this study for social media guidelines and the treatment of individuals with NSSI.

Submission ID: 30

- **Authors:** *Catharina Hamann and Bankmann, Julian and Kornhuber, Johannes and Lesch, Klaus-Peter and Zoicas, Iulia and Schmitt-Böhrer, Angelika*
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- **Abstract topic:** Experimental stress and anxiety research
- **Type of presentation:** Onsite Poster

Social fear affects limbic system neuronal activity and gene expression

Among the wide spectrum of psychiatric disorders, social anxiety disorder (SAD), also known as social phobia, is a highly prevalent and comorbid anxiety disorder (lifetime prevalence of approximately 12%) with rather unclear underlying mechanisms. The phenotype can be very complex based on a number of characteristics, core symptoms include fear and avoidance of social situations where individuals feel critically observed or judged by others. The median 12-month prevalence of SAD in Europe is estimated at around 2.3% (Wittchen & Jacobi 2012).

We aimed to characterize neurobiological changes occurring in a mouse model of SAD to identify possible therapeutic targets. Social fear was induced via social fear conditioning (SFC), a validated animal model to specifically induce SAD in rodents (Toth et al. 2012). We investigated expression levels of the immediate early genes (IEGs) cFos, Fos12 and Arc, as well as number and density of c-Fos positive cells as markers of neuronal activity. Additionally, we investigated the expression levels of several genes of the GABAergic, serotonergic, oxytocinergic, vasopressinergic and neuropeptide Y (NPY)-ergic systems. Target brain regions that are involved in social- as well as fear-related behaviour include the paraventricular nucleus of the hypothalamus, basolateral amygdala, septum, hippocampus and dorsal raphe nucleus. The experimental setup investigated animals with (SFC+) and without (SFC-) social fear conditioning experience 2 hours after exposure to a conspecific. SFC+ mice showed a decreased number and density of cFos-positive cells and decreased expression levels of IEGs in the anterior hippocampus. SFC+ mice also showed alterations in the expression of NPY and serotonin system-related genes in all investigated brain regions except the hippocampus.

Our results describe neuronal alterations occurring during the expression of social fear and identify the NPY and serotonergic system as possible targets in the treatment of SAD.

Submission ID: 32

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Research Platform “The Stress of Life – Processes and Mechanisms underlying Everyday Life Stress”, Vienna, Austria

- **Abstract topic:** Experimental stress and anxiety research
- **Type of presentation:** Onsite Poster

Effects of music listening on stress and skin barrier recovery: preliminary results

OBJECTIVE

Psychological stress is known to have widespread effects on bodily health and immune function, as it is linked with dysregulation of the HPA axis. Music listening has been shown to be an effective method for alleviating stress, suggesting that music, by way of its effectiveness in reducing stress, may also have beneficial effects on immune function, for instance, speed of wound healing. In the present study, we assessed whether music listening after acute stress accelerates skin barrier recovery (SBR) after mechanical disruption, an established index of immune function, and whether this effect is mediated by reductions in stress.

METHODS

We examined the effects of a 30-minute music listening intervention on psychological and physiological indices of stress, and recovery of the skin barrier after impairment. Acute stress was induced in female participants using the Trier Social Stress Test, after which they were subjected to either a music listening intervention or one of two control conditions (audiobook, silence). A tape stripping paradigm was used to impair the skin barrier on participants' forearm, followed by repeated transepidermal water loss (TEWL) measurements over the course of the 4-hour experiment to assess SBR. Subjective, physiological (heart rate, electrodermal activity (EDA)), and salivary (alpha-amylase, cortisol), stress markers were collected at multiple time points.

RESULTS

Preliminary results from the first consecutive participants (n = 50) show a trend of music listening enhancing Relaxed Positive Affect (known to be negatively correlated with stress) more strongly than sitting in silence, but not more strongly than listening to an audiobook. A similar trend was observed for ratings on the scale Calm-Nervous mood of the Multidimensional Mood State Questionnaire (MDBF). Subjective stress did not decrease more strongly after music listening than after listening to an audiobook or sitting in silence. To assess effects of the audio intervention on physiological measures (n = 40), averaged values from 5-minute windows spanning the last 5 minutes of the audio intervention were compared with time windows immediately preceding it. Heart rate decreases did not significantly differ between conditions. EDA decreases showed a trend, with the decrease being stronger for the music than for the audiobook condition. Skin barrier recovery, quantified by the area under the curve (AUC) aggregating all TEWL measurement time points after skin impairment, did not differ between conditions.

CONCLUSION

Our preliminary data provide some first evidence that a lab-based music intervention after acute stress is effective in increasing positive affect and calm mood, and in reducing EDA. Although findings from the current incomplete sample should be interpreted with extreme caution due to the lack of statistical power to detect modest effects, our paradigm is a promising tool for studying the effects of brief experimental music manipulations on bodily health. Statistical analyses from a larger sample will be presented at the conference.

Submission ID 33: Lifelong effects of prenatal and early postnatal stress on the hippocampus, amygdala, and psychology of war survivors

- **Authors:** *Monika Fňášková* and *Pavel Říha* and *Marketa Nečasová* and *Marek Preiss* and *Ivan Rektor*
- **Affiliation details: department, institution / hospital, city, state (if relevant), country:** Central European Institute of Technology, Masaryk University, Brno, Czech Republic
- **Abstract topic:** Stress and anxiety in children and adolescents
- **Type of presentation:** Onsite Poster

Objective

This study examines the lifelong consequences of war stress experienced in early development. Specifically, we focus on the effect of age on hippocampal and amygdala stress damage in Holocaust survivors, with an emphasis on prenatal and early postnatal development as a highly sensitive period of life that can disrupt the process of normal development of brain structures and functions.

Methods

We investigated civilian people who lived in Central Europe during the Holocaust and who, as Jews, were in imminent danger of their lives. Group who experienced stress during their prenatal development and early postnatal (PreP) period (n = 11) were compared with a group who experienced Holocaust-related stress later in their lives: in late childhood, adolescence, and early adulthood (ChA) (n = 21).

Results

The results of volumetry analysis showed significantly lower volumes of both hippocampi and the right amygdala in the PreP group. Seed-based connectivity analysis revealed increased connectivity from the left hippocampus to the thalami and caudate and from the seed in the right amygdala to the middle and posterior cingulate cortex, caudate, and left frontal operculum inferior in the PreP group. Psychological testing found higher levels of traumatic stress symptoms (TCS-40) and lower levels of well-being (SOS-10) in the PreP group than in the ChA group.

Conclusion

The results of our study demonstrate that extreme stress experienced during prenatal and early postnatal life has an irreversible lifelong impact on the hippocampus and amygdala and on some psychological characteristics of Holocaust survivors. Despite the small sample size due to the specifics of the study group (Jewish children born during the war usually did not survive the war; age of participants at the time of participation in the study), our

findings confirm the importance of the timing of stress exposure on the resulting effects on the brain and mind.

Submission ID: 37

- **Authors:** *Angelika Schmitt-Böhrer and Schwert, Henning and Pöllmann, Mara and Salur, Elif and Lesch, Klaus-Peter and Asan, Esther*
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- **Abstract topic:** Neurobiology of anxiety and stress
- **Type of presentation:** Onsite Poster

Title: Impact of serotonin-transporter deficiency on peptidergic systems in the basolateral amygdala

Objective. Serotonin (5-HT) shapes brain networks during development and modulates a wide spectrum of essential neuronal functions of the mature brain. Imbalances in 5-HT-moderated synaptic signaling impacts the pathophysiology and treatment response of psychiatric disorders with emotional dysregulation such as anxiety disorders and depression. Experimental studies indicate that dysregulated activity of projection neurons (PN) in the basolateral amygdala (BLA), a key component of the “fear network”, contributes to maladaptive fear responses. PN activity is modulated by intrinsic networks formed by peptidergic/inhibitory non-pyramidal neurons (NPN), and both neuronal populations are influenced by 5-HT-transmission. Mice deficient for the 5-HT transporter (5-HTT KO mice), which exhibit increased anxiety-like behavior and altered stress response, display morphological alterations of BLA-PN neurons indicative of enhanced activity and/or a decrease in modulatory network capacity. In the present study, possible genotype-related alterations in peptidergic modulatory systems were studied in the BLA of wildtype and 5-HTT KO mice, focusing on the neuropeptide Y (NPY)-system. NPY is an anxiolytic peptide known to exert powerful influence on activity and morphology of BLA-PN. As somatostatin (SOM) is coexpressed in NPY BL-NPN, and CRF promotes opposing effects to NPY on BLA-PN, these systems were included.

Material and Methods. Amygdala-containing brain tissue sections of male naive WT and 5-HTT KO mice on a C57BL/6J genetic background were used for immunohistochemical and -fluorescence single and double stainings using 5-HTT-, 5-HT-, NPY-, SOM-, and parvalbumin (PV)-antibodies. For mRNA analyses, BLA tissue from WT and 5-HTT KO animals was laser microdissected and used for quantitative real time PCR detection of mRNA for NPY and NPY receptors Npyr1 and Npyr2; SOM and SOM-receptors Sstr2 and Sstr4; CRF and CRF-receptors Crfr1 and Crfr2; 5-HT-receptors 5Htr1a, 5Htr2a and 5Htr2c.

Results. Qualitative analyses of immunolabeling revealed dense serotonergic fiber plexus and perisomatic appositions of serotonergic fibers on NPY-immunoreactive (ir) neurons in the BLA of WT and 5-HTT KO mice. Also, similar morphological subtypes of NPY neurons

(round and fusiform), colocalization of SOM-ir in NPY-ir neurons, and additional single labeled NPY- and SOM-ir neurons were found in both genotypes. However, quantitative analyses documented a highly significant reduction of the density of NPY-ir neurons in the BLA of 5-HTT KO compared to 5-HTT-WT mice throughout the rostrocaudal extent of the amygdala, while no difference was found for PV-neurons, another subtype of BLA-NPN. Gene expression studies failed to detect genotype-related mRNA-differences for all analysed peptides, indicating that the decrease in NPY-containing NPN numbers is due to differential regulation of propeptide mRNA translation rather than developmentally caused absence of NPY-BLA-NPN. Of the receptors analysed, Npyr2, SStr4 and Crfr1 displayed increased mRNA expression levels in 5-HTT KO mice.

Conclusion. The results clearly show that the disrupted serotonin homeostasis in 5-HTT KO mice affects the NPY system and presumably leads to dysfunction of this specific modulatory network in the BLA. Increased signalling via Crf1 may contribute to functional effects of peptide-system alterations in 5-HTT KO mice. Disturbances in the complex interplay of inhibition and disinhibition may be the result.

Submission ID 41: Extinction modulates cell type-specific intrinsic excitability and cannabinoid type 1 receptor-dependent plasticity at medial prefrontal cortex inputs in basal amygdala

- **Authors:** *Julia Constance Bartsch and Remmes, Jasmin and Seidenbecher, Thomas Edgar and Pape, Hans-Christian*
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- **Abstract topic:** Neurobiology of anxiety and stress
- **Type of presentation:** Onsite Poster

Adaptive fear responses are crucial for survival. An inability to extinguish fear and aversive memories is a hallmark of post-traumatic stress disorder. Projections from the medial prefrontal cortex (mPFC) to the basal amygdala (BA) and the cannabinoid type 1 receptor (CB1R) have both been implicated with proper fear extinction. Here, we used channelrhodopsin-assisted circuit mapping and Cre-mediated functional deletion or rescue of CB1R in mPFC and combined fear training and behavioral studies in vivo with optogenetic-electrophysiological analysis ex vivo to assess fear extinction-related CB1R-dependent modulation of mPFC-BA excitatory synaptic circuits. We show that glutamatergic projections arising from the mPFC target both principal neurons and putative interneurons of the BA and CB1R mediate depolarization-induced suppression of excitation at these inputs. Fear extinction elevated the induction threshold for this form of short-term synaptic plasticity selectively at mPFC inputs to BA principal neurons. Fear extinction also modulated action potential waveform and intrinsic excitability exclusively in BA principal neurons accompanied by reduced network-driven inhibition. Finally, we demonstrate that targeting Cre to the infralimbic division of the mPFC for functional deletion of CB1R in CB1lox/lox mice impairs retrieval of extinction memory even after successful fear extinction training.

Submission ID 48: Negative emotionality in relation to epigenetics of estrogen signaling during puberty

- **Authors:** *Mirac Nur Musaoglu and Vanessa Nieratschker and Erika Comasco and Birgit Derntl*
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- **Abstract topic:** Stress and anxiety in children and adolescents
- **Type of presentation:** Onsite Poster

After puberty, the prevalence of affective disorders increases in females compared to men, with depression and anxiety being twice as common in women. A potential mechanism behind this could be the sex-specific neuroendocrine changes during puberty, which affect stress reactivity. The onset of puberty and neuroendocrine changes during this period are regulated by epigenetic mechanisms and puberty leads to changes in DNA methylation of more than 300 genes in girls, among which estrogen-responsive genes are overrepresented.

This study aims to shed light on the neurobiological mechanisms underlying the emerging sex differences in the prevalence of affective disorders after puberty. Specifically, its objective is to examine the epigenetic modifications and following changes in gene expression rates in estrogen-related genes and whether they are associated with alterations in the stress and startle response at molecular, neuronal, and physiological levels during pubertal transition.

The study is planned in a cross-sectional design and will include only healthy participants. Two groups of girls will be studied: 100 pre-pubertal (8-10 years of age) and 100 post-pubertal (15-17). The pubertal state will be assessed to ensure the correct composition of the two study groups. The data on prenatal complications, adverse life events, coping mechanisms, mood and anxiety symptoms will be collected with self and parent-report questionnaires. Half of the participants randomly selected per group will undergo structural and functional neuronal imaging with magnetic resonance. In the scanner, a stress paradigm, Montreal Imaging Stress Task (MIST), will be conducted to examine neuronal correlates of acute stress response. Heart rate and skin conductance will be measured to examine physiological stress response during MIST. Acoustic startle response and its prepulse inhibition will be evaluated in the other half of the participants to assess physiological response to negative emotionality and sensorimotor gating mechanisms.

DNA methylation will be analyzed from whole blood using pyrosequencing in genes associated with estrogen signaling (ESR1, ESR2, GPER1, CYP19A1) and neuronal estrogen response genes (MTNR1B, GRM2, GRIK5, SLC12A5, KCNJ8, BDNF and ESC/E(Z) genes). The effects of methylation on gene expression will be measured using reverse transcription real-time PCR. Cortisol levels from saliva samples collected before and after MIST will be assessed using ELISA. Steroid hormone levels will be analyzed with liquid chromatography with tandem mass spectrometry.

Data collection for the explained study protocol has not started yet. Based on the findings of this study, future studies might investigate the epigenetic regulation of estrogen-signaling genes in clinical groups with depression and anxiety in a cohort of pubertal girls and women beyond puberty.

Submission ID: 49

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- **Abstract topic:** Stress and anxiety in children and adolescents
- **Type of presentation:** Onsite Poster

Title: Neural reactivity to valence of psychosocial feedback in early adolescents.

Objective: Adolescence is a period where reactivity to salient environmental cues and acute stress increases due to the physiological changes during and after puberty. In addition, there is heightened psychosocial stress relative to adulthood and childhood. Peer comparison and social evaluation become an important daily interaction. Hence, we investigated the effects of valence of psychosocial evaluative feedback after acute stress, using a modified version of the Montreal Stress Imaging Task (MIST) in a group of early adolescents.

Methods: 61 participants (35 Females) with a mean age of 13.84 years underwent a psychosocial stress task in 3T scanner. The experimental runs consisted of acute stressor of 5 difficult mental calculations with time limit, followed by an 8-sec psychosocial feedback and ranking among peers. Each run ended with a 90 sec resting period. There were 4 runs with positive and 4 runs with negative feedback. In addition, there were 4 control runs with simple calculations and neutral feedback and no ranking. Participants also filled in State and Trait Anxiety for Children and Beck's Depression Inventory (BDI) questionnaires before entering the scanner. For second level image analysis: we used one-way Anova within subjects for the whole group. We split them into two groups: no depressive symptoms (BDI<10, n=39) and depressive symptoms (BDI>=10, n=22) and performed two-group t-test on SPM12.

Results: Positive feedback elicited activation in right anterior prefrontal cortex, precentral gyrus, middle frontal gyrus and right superior parietal gyrus in the whole group. Negative feedback showed activation in the high vs low BDI group comparison. The group with depressive symptoms (BDI>=10) showed activation in the posterior cingulate cortex, left anterior prefrontal cortex and several regions of the cerebellum during negative feedback, compared to group without symptoms. There were no differences between groups for

positive feedback.

Conclusions: These results suggest that positive feedback generally activates regions related to positive emotions and promotes attention in proactive brain areas. Negative feedback on the other hand, increases baseline trait tendency of activation of the self-reflective regions in early adolescents.

Submission ID 51: An Animal Model for Approach and Avoidance Behavior in Social Situations: Establishing A Combined Paradigm of Social Fear Conditioning and Social Buffering

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- **Abstract topic:** Social aspects of stress and anxiety
- **Type of presentation:** Onsite Poster

Social Anxiety Disorder (SAD), also known as social phobia, is characterized by significant anxiety specifically in social situations due to fear being scrutinized or negatively judged by others. SAD is a major risk factor for the development of additional psychiatric disorders, as it often manifests earlier than other comorbid conditions such as depression, substance use disorders, and other anxiety disorders. To gain a deeper understanding of this disorder and to explore potential treatment options, a novel behavioral paradigm named social fear conditioning (SFC) was developed to specifically induce social fear in rodents. Unlike other animal models for SAD, SFC specifically induces social fear, but not general anxiety or depression up to three weeks after conditioning. A comorbid depression develops after four to five weeks.

A phenomenon known as "social buffering" (SB) refers to the ability of social support to act as a protective buffer against the detrimental consequences of stressful events. Merely having a companion present can alleviate anxiety, stress, depression, and even physical pain. The efficacy of SB has been substantiated not only through animal experiments but also through human studies.

In this planned study, we aim to establish a paradigm that combines SFC with SB. This combination will allow us to investigate whether and to what extent SB can mitigate social fear induced by SFC. Given that men and women often respond differently to therapy and the prevalence of SAD is higher in women, the inclusion of male and female mice will enable us to explore potential sex differences in the induction of social fear, as well as in the effectiveness of SB.

In a previous study, we demonstrated that SFC induces social fear and leads to alterations in the expression levels of genes related to the Neuropeptide Y system in male mice. With this study, we will not only establish a working SFC-SB paradigm, but we will also analyse the underlying neurobiological mechanisms of the induction of social fear as well as the effects of SB in mice across different sexes, with a particular focus on the amygdala.

The first part of our planned study will involve corroboration of the specificity of SFC for induction of social fear but not general anxiety both in female and male C57BL/6J mice. Our second project will focus on comparing the effectiveness of three types of SB: 1) exclusively olfactory buffering, 2) visual and olfactory buffering, and 3) tactile, visual, and olfactory buffering. Through this comparison, we aim to identify the most suitable type of SB for social fear.

This investigation will pave the way for planned future experiments in exploring the influence of these neurotransmitter systems through analyses of neuronal activation patterns with particular attention to the serotonergic and peptidergic systems in brain tissue of experimental animals which will complement the behavioral study. Our overarching objective is, with a specific emphasis on sex differences, to uncover the molecular mechanisms underlying on approach and avoidance behaviors within a social context.

Submission ID 52: Anxiety levels and structural brain connectivity in early pubertal transgender and cisgender youth

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- **Abstract topic:** Stress and anxiety in children and adolescents
- **Type of presentation:** Onsite Poster

Transgender adolescents are at higher risk for developing affective disorders compared to their peers. Early socially transitioned transgender children are less likely to develop depression and only show slightly elevated anxiety levels. However, distal, and proximal minority stressors can affect the severity of the affective symptomatology. Furthermore, hormonal changes during puberty influence brain development, but the effects of sex steroids on structural brain connectivity remain unclear. We investigated how the degree of gender-dysphoria, anxiety levels and depression scores correlate with experienced peer problems and familial support in early pubertal youth. We also explored the effects of gender identity and natal sex at early stages of puberty on the brain's structural connectivity, in particular on the white matter properties of the inferior fronto-occipital fasciculus (IFOF).

Transgender (n=25) and cisgender (n=23) adolescents matched for pubertal stage (Tanner 2; 13.1 +/-1.5y) indicated self-perceived peer problems, degree of gender-dysphoria, and completed the Multidimensional Anxiety Scale for Children 2 (MASC) and the Children's Depression Inventory 2 (CDI). Using Spearman correlations, we tested the relationship of standardized MASC and CDI scores with gender-dysphoria and levels of peer problems. A generalized linear model (GLM) was fitted, testing the interaction of familial support and peer problems on MASC and CDI scores for the transgender participants (n=25). For n=17 adolescents, we analyzed diffusion MRI data. We performed tractography and extracted tissue properties of the bilateral IFOF, including mean diffusivity (MD) and fractional anisotropy (FA) to test effects of gender identity and natal sex using one-way ANOVAs and t-tests. Tract profiles were compared using post-hoc t-tests.

We found no significant correlation between gender-dysphoria and the MASC (P=0.28), but between gender-dysphoria and the CDI (P=0.013). There were significant positive correlations between the level of peer problems and the MASC score (P<0.001) and the CDI

score ($P < 0.001$), respectively. The GLM analysis predicted the MASC and the CDI scores using peer problems and familial support as additive and interactive variables significantly better than the null model ($P < 0.001$). For the structural brain connectivity analysis, we found no significant effects of gender identity on the white matter properties of the IFOF. MD in bilateral IFOF was higher for natal males compared to natal females ($P < 0.05$). Post-hoc t-tests of the tract profiles confirmed this difference among the natal sex groups.

The positive correlation between peer problems and the degree of gender-dysphoria, anxiety and depression scores suggest that the peer problems may act as distal minority stressors. The positive correlation between gender-dysphoria and the CDI could indicate a proximal stressor. The GLM exploring the relationship of depression with peer problems and family support as interacting factors indicated that strong familial support might counteract the effect of peer problems and decrease depression scores. The GLM indicates familial support as positive estimate suggesting that higher MASC values call for stronger support. Regarding structural brain connectivity, natal sex differences were found in the bilateral IFOF. This evidence could have implications for children's health, in adding to our knowledge of gender- and sex-specific differences in brain development during puberty.

Submission ID: 53

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- **Abstract topic:** Stress-related and anxiety disorders
- **Type of presentation:** Onsite Poster

Fronto-striatal dynamics and optogenetic approaches to remodel impulsive choice

Objective: Tryptophan hydroxylase (TPH) is the rate-limiting enzyme required for the production of serotonin. There are two isoforms of TPH; TPH2 is mostly expressed in neuronal cells. In humans, genetic variants of TPH2 are associated with major depressive disorder, bipolar disorder and ADHD. In mice, a genetically induced knockout (KO) of the TPH2 leads to higher impulsivity and aggression. An imbalance in the serotonergic system can also influence the process of medial prefrontal cortex (mPFC) development. Another animal model of low brain serotonin levels called BALB/cJ exhibits an altered distribution of Parvalbumin positive interneurons (PV+-interneurons) in the anterior cingulate and midcingulate cortices (ACC and MCC). We suggest that mice with a full knockout of TPH2 will exhibit a reduction in PV+-interneurons, which can lead to the inhibitory/excitatory imbalance in frontostriatal circuits. We also suggest that optogenetic manipulation of PV+-interneurons will decrease aggression and impulsivity observed in TPH2-KO animals.

Methods: a) The immunofluorescence labelling was performed to confirm the altered distribution of the PV+-cells across the ACC and MCC brain regions of TPH2-KO and heterozygous mice in comparison to wild type controls. The experimental design included six equal groups based on sex (females and males) and genotype (TPH2 knockout, heterozygous and wild type) of the animals. DAPI and PV-antibodies were used to label PV+-cells across 20 µm thick coronal slices of brain regions of interest: ACC (range of AP coordinates: 1.09 mm to 0.13 mm according to Bregma) and MCC (from 0.13 mm to -0.83 mm (MCC) according to Bregma).

b) The optogenetic methods of inhibition and activation of PV+-interneurons of ACC will be used to manipulate the activity of the cell-subpopulation. We suggest that these manipulations will reduce the aggression and impulsivity observed in TPH2-KO mice.

Results: The preliminary data of immunofluorescence labelling shows that there are no significant differences in distribution of PV+-interneurons across the ACC and MCC of male animals. Moreover, distribution of PV+-interneurons across MCC of male knockout and heterozygous animals demonstrates a tendency to increase in comparison to wild-type controls. The preliminary data for female mice shows that distribution of PV+-interneurons across ACC and MCC of knockout animals demonstrates a significant reduction in comparison to heterozygous and wild-type animals.

Conclusion: The preliminary data from immunofluorescence labelling shows that female TPH2-KO mice demonstrate altered distribution of PV+-interneurons in the anterior cingulate cortex and midcingulate cortex. We suggest that observed alterations are associated with a disruption of the serotonergic system caused by a knockout of the Tph2 gene. The reduced amount of PV+-interneurons may change the inhibition/excitation balance in the frontostriatal circuit and thereby be one of the reasons for the impulsive and aggressive behavior observed in TPH2 knockout mice. The group size will be increased and the additional brain regions known to be associated with the control of behavior (infralimbic and prelimbic cortices) will be taken in consideration. The performed immunofluorescence labeling also provided the information needed to decide on the areas for the following opsin's injections.

Submission ID 54: Childhood Trauma Is Linked to Epigenetic Age Deceleration in Young Adults with Previous Youth Residential Care Placements

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- **Abstract topic:** Genetics and epigenetics of anxiety and stress
- **Type of presentation:** Onsite Poster

Early life adversity (ELA) increases the risk for mental and physical disorders and premature death. Epigenetic processes, like altered epigenetic aging, may mediate these effects. In some yet not all previous studies ELA was linked to accelerated epigenetic aging. This inconsistency might be due to limitations of retrospectively assessed ELA measures. High risk samples like populations raised in residential care might remedy this, as their biography validates their exposure to ELA. This study therefore explored the link between ELA and epigenetic aging in a sample of formerly institutionalized adults.

N=117 participants (32% women, age mean=26.3, SD=3.6 years) from a longitudinal study on care leavers completed the Childhood Trauma Questionnaire and the Life-Events-Checklist and provided blood samples for the analysis of DNA methylation using the Illumina Infinium MethylationEPIC BeadChip Microarray. We calculated Horvath's and Hannum's epigenetic clocks. Age acceleration was operationalized using regression based residuals as well as the distance between chronological and epigenetic age. The statistical analysis plan was preregistered on OSF (<https://osf.io/b9ev8>).

Statistical analyses revealed a positive association between chronological and epigenetic age (Horvath: $r(115)=.70$, Hannum: $r(115)=.71$). On average, Horvath's age was greater, $t(116)=-8.66$, $d=-0.80$, and Hannum's age was smaller than participant's chronological age, $t(116)=24.12$, $d=2.23$. ELA (as indexed by CTQ total score) was negatively associated with all operationalizations of age acceleration, $r(115)=-.18$ to $-.26$. In contrast, lifetime trauma exposure was no significant predictor of epigenetic ageing.

Thus, our findings suggest that the effect of trauma on decelerated epigenetic ageing seems to be selective for experiences in childhood.

Submission ID: 60

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- **Abstract topic:** Experimental stress and anxiety research
- **Type of presentation:** Onsite Poster

Same or different? Effect of estradiol on stress reactivity in pre- and postmenopausal women

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Stress leads to behavioural, endocrine and psychological changes that causes bodily and mental tension, affecting physical and psychological well-being. Interestingly the stress response as well as the prevalence of stress-related diseases differ between men and women as well as between pre- and postmenopausal women. Thus, it might be assumed that differences in hormonal fluctuations present a general vulnerability factor for stress-related diseases. Brain areas like the hippocampus and prefrontal areas, which control the amygdala response to stress, are involved in the regulation of the stress response. Importantly the activity of these areas is modulated by the gonadal hormone estradiol. Recently, a model has been proposed on how estradiol fluctuations alter the stress reactivity in naturally cycling women with high levels of estradiol. Estradiol may directly modulate the activity, connectivity and structure of amygdala, hippocampus and prefrontal areas in a way that it reduces stress reactivity in naturally cycling women. However, postmenopausal women, who have ceased estradiol fluctuations due to the menopausal

transition, seem to show an altered response with increased stress reactivity when receiving exogenous estradiol. The goal of the proposed study is to directly test estradiol's modulating effect on the stress response in two groups of women: (1) naturally cycling women during their early follicular phase, and (2) postmenopausal women. In a repeated-measures within-between placebo-controlled design, both groups of women will receive either a placebo or estradiol valerate to experimentally increase estradiol levels, and they will further undergo a psychosocial stress task (Montreal Imaging Stress Task) in a neuroimaging environment (fMRI). By applying a multilevel approach, we will be able to look at stress reactivity from a subjective, sympathetic (heart rate, skin conductance), endocrine (cortisol) and neural perspective. We will further assess how changes in stress reactivity due to estradiol increase are associated with gonadal hormones, and changes in neural activity, anatomy and connectivity in pre- compared to post-menopausal women.

We hypothesize that during states of high estradiol naturally cycling women compared to postmenopausal women will show less subjective stress, higher hippocampus and prefrontal and less amygdala activation due to psychosocial stress induction. Furthermore, hippocampal grey matter volume and hippocampus-amygdala connectivity may be altered due to estradiol levels. The results of this study can potentially highlight risk factors of stress-related disorders. With our study design we are aiming to close the knowledge gap on data in postmenopausal women in neuroimaging and stress research and on how hormonal transition phases effect the wellbeing and mental health of women throughout their life span.

Submission ID 62: The Association between Lifetime Stress Exposure and Social Trust Learning.

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- **Abstract topic:** Stress and cognition
- **Type of presentation:** Onsite Poster

Background. Stress is omnipresent in daily life, with potentially negative effects on health and well-being. Social connections have been shown to buffer these adverse effects. However, we know little about how the experience of lifetime stress exposure impacts one's ability to foster and maintain social relationships. Here, we investigated the association between life stress and trust formation using a social reinforcement learning paradigm to understand how stress impacts the development of trust, particularly when the trustworthiness of others changes. Methods. To assess levels of stress, we used the STRAIN, a well-validated structured interview, to assess the frequency and severity of experienced lifetime stress exposure in 170 participants. To examine trust learning, we used a repeated trust game in which participants had to learn, over several rounds ("interactions"), how much they should trust two different trustees. After participants had learned these contingencies, the trustee's behaviours changed, allowing us to determine how participants would react to changes in their decision space. We used Bayesian modelling to assess how the updating of beliefs about the trustworthiness of others was affected by stress. Results. We find that lifetime stress exposure had an impact on the manner in which participants learned about others' intentions in a repeated trust game, as indicated by lower mean investments, and a higher sensitivity to social feedback, parametrized by the learning rate. Conclusion. Social trust is foundational for the maintenance and facilitation of social connectedness, and as such may have a profound impact on health and well-being. These results highlight that even small transgressions might be more consequential with higher levels of life stress. As such, our findings highlight the importance of studying the effects of life stress on basic social mechanisms in order to better understand risk and resilience factors for health.

Submission ID 65: Positive and negative effects of social media use in adolescent girls

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- **Abstract topic:** Stress and anxiety in children and adolescents
- **Type of presentation:** Onsite Poster

Pubertal onset carries along biological, physical, psychological, and social changes in adolescents' lives, and it also marks the start of the reproductive lifespan in adolescent girls^{1,2,3}. The prevalence and severity of mental health issues increase during adolescence, with girls being disproportionately affected by increased depressive and anxiety symptoms, body dissatisfaction, and disordered eating¹. After a peripubertal stage characterized by anovulatory and irregular hormonal cycles, adolescent girls will experience monthly menstrual cycles, with fluctuations of estradiol and progesterone⁴. The pubertal onset and hormonal fluctuations of the menstrual cycle have been linked with changes in adolescent girls' affective status and, on a neural level, reward sensitivity (e.g., social reward)^{3,5,6,7}. Additionally, the intake of hormonal contraceptives in adolescent girls has also been longitudinally linked with increased depressive symptoms^{8,9}. All these factors create a vulnerable period for adolescent girls' mental health, especially regarding internalizing disorders, such as depressive and anxiety symptoms.

Another factor that poses a risk to their mental health is social media usage. Research suggests that social media platforms are most heavily utilized by adolescents¹⁰. Throughout adolescence, girls are more likely to report higher social media use than males and pathological use of social media¹⁰. Adolescent girls are also more likely to engage in social media activities containing posting information and pictures about themselves which has been associated with an increased prevalence of internalizing symptoms, such as depressive and anxiety symptoms¹¹. Other negative effects of social media use in adolescent girls include body image concerns, reduced self-esteem, and disordered eating^{12,13,14}. Considering that adolescent girls experience great physiological and psychological changes during puberty, it is essential to explore the way social media use changes with hormonal fluctuations in adolescent girls. Thus, this study aims to explore and understand whether there is a period throughout the menstrual cycle when adolescent girls are most vulnerable to excessive social media use and remarks from social media.

This study will include healthy adolescent girls (15-18 years) and will recruit naturally cycling adolescent girls (n=35) and adolescent girls using oral combined hormonal contraceptives (n=35). The assessment will start on the first day of the menses and the first pill intake, respectively. They will be assessed at two time points of the menstrual cycle, during the follicular phase and the luteal phase. The hormonal contraceptive group will be assessed during their active intake period and inactive period. For the experiments, they will undergo fMRI tasks assessing their responses to food, monetary, and social rewards.

Additionally, blood samples will be derived for hormonal assessment and psychometric data will be used to assess self-esteem, social connectedness, and social media addiction. Additionally, they will report their menstrual pain, social media activity, and affective state throughout one month through ecological momentary assessment.

This study is essential in exploring the interrelation of hormonal status, social media use, reward processing, and affective status in adolescent girls to help develop prevention and intervention techniques in clinical settings in the future.

Submission ID 66: The “sunshine” vitamin and anxiety symptoms: how does supplementation of vitamin D3 affect the anxiety levels among the students – results of an international survey

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- **Abstract topic:** COVID-19, stress and anxiety
- **Type of presentation:** Onsite Poster

1) Objective

Many studies confirmed the association between low levels of vitamin D and symptoms of anxiety and depression, as well as lower immunity. COVID-19 pandemic mobility restrictions and avoidance of going outside to diminish the possibility to contract the virus could lead to hypovitaminosis D3 in individuals if it was not accompanied by appropriate supplementation. This study aims to examine if vitamin D3 supplementation correlates the level of anxiety symptoms in a group of students from 9 countries during the COVID-19 pandemic.

(2) Methods

An online cross-sectional survey was distributed amongst Polish (N=1202), Bengali (N=1580), Indian (N=484), Mexican (N=234), Egyptian (N=566), Philippine (N=2076), Pakistani (N=500), Chinese (N=504), Vietnamese (N=68) students (N=7214). The survey was opened on 12th April and closed on 1st June 2021. Respondents' anxiety level was measured by the Depression, Anxiety, and Stress Scale-21 (DASS-21) and to assess their vitamin D3 frequency supplementation students were asked to answer closed-end questions.

Students were divided into 3 groups: 1) regularly supplementing vitamin D3 (RVD), 2) often supplementing vitamin D3 (OVD), and 3) no supplementation (NVD).

(3) Results

Participants who never took vitamin D3 had significantly higher level of anxiety than other groups ($p < 0.005$). Generally, students from two subgroups: NVD (Me=12.00+/-10.33) as well as OVD (Me=10.00+/-10.68) presented moderate levels of anxiety according to DASS-21, and those, who regularly took this supplement were in the mild range (Me=8.00+/-10.97). Pakistani participants regularly taking vitamin D3 had significantly lower anxiety levels (Me=14.00+/-7.84, moderate range) compared to NVD (Me=18.00+/-9.56, severe range) ($p < 0.005$) and OVD (Me=19.00+/-8.25, severe range) ($p < 0.001$). On the contrary, Bengali students in the NVD group presented the lowest anxiety levels (Me=6.00+/-9.50, normal range) compared to participants in RVD (Me = 14.00+/-10.07, moderate range) and OVD (Me=8.00+/-9.55, mild range) ($p < 0.001$). In Egypt students that never (Me=0.00+/-9.89) and regularly (Me=0.00+/-14.38) took this supplement had anxiety symptoms at the normal range, while often users had moderate levels of anxiety (Me=14.00+/-13.20) ($p < 0.05$). In the remaining countries (Poland, the Philippines, China, Mexico, India, and Vietnam) there noted no significant differences between the frequency of taking vitamin D and the level of anxiety ($p > 0.05$).

(4) Conclusion

During the Covid-19 pandemic students that never used vitamin D3 supplementation showed the highest level of anxiety symptoms compared to participants that used regularly or often in the whole study group. Nevertheless, the same pattern was confirmed only in a group of Pakistani students. Most countries had different outcomes or the frequency of vitamin D supplementation did not affect the level of anxiety symptoms. There are some explanations for these results: 1) the country policy during the pandemic was different in every country, and not all had specific lock-down issued; 2) the frequency of supplementation did not always reflect the serum level of vitamin D3, which could have a different impact on student's well-being; 3) taking vitamin D3 could be potentially a coping mechanism, so students that were more prone to higher levels of anxiety were more frequent users of the vitamin. This study showed light on this phenomenon, but more studies are needed to fully understand it.

Submission ID 67: Associations between dosage, serum concentration and clinical outcome of SSRI fluoxetine in a transdiagnostic sample of youths: a therapeutic drug monitoring study

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- **Abstract topic:** Depression
- **Type of presentation:** Onsite Poster

Objective: Fluoxetine is a selective serotonin reuptake inhibitor used in children and adolescents as a pharmacological treatment for moderate and severe depression, as well as off-label for numerous other indications. However, the associations between daily dose, serum concentrations and both clinical and adverse effects remain unclear. Additionally, therapeutic serum references have not yet been determined for this age group. Young individuals may metabolize drugs differently owing to developmental processes, such as CYP activity, organ and hormonal changes and other age-related factors.

Methods: Within a large epidemiological prospective multicenter pharmacovigilance study ("TDM-VIGIL"), a transdiagnostic sample of children and adolescents ($n = 138$; mean age, 15.34 ± 1.87 ; range, 7–18 years, 24.6% males) was treated with fluoxetine (10–40 mg/day). The study spanned three routine healthcare settings (i.e., inpatient, outpatient and day-treatment), and included patients had either started treatment with fluoxetine or switched to fluoxetine. The serum concentrations of fluoxetine (FLX), norfluoxetine (NORFLX) and the active moiety (FLX + NORFLX) at steady-state were determined using isocratic reversed-phase high-performance liquid chromatography (RP-HPLC). The 7-point Clinical Global Impression Scale and Pediatric Adverse Event Rating Scale were used to measure clinical and adverse responses, respectively. Both the last timepoint data ($n = 138$ observations) and all timepoint data ($n = 292$ observations) were assessed to investigate the associations between dose, serum concentration, outcome and other predictors by means of (multiple) linear regression, linear mixed-effect and cumulative link (mixed) models.

Results: Marked (45.6%) and minimal (43.5%) improvements were the most common treatment outcomes. Fluoxetine was overall well tolerated; most patients reported no adverse effects (64.9%), followed by moderate (19.4%) and slight (13.4%) adverse effects. Dose and serum concentration of fluoxetine and its metabolites exhibited strong positive linear associations (FLX, $\beta = 0.18$, CI 0.09–0.26, $p < 0.001$; NORFLX, $\beta = 0.19$, CI 0.10–0.27, $p < 0.001$; FLX+NORFLX, $\beta = 0.24$, CI 0.14–0.34, $p < 0.001$). No concentration-response effect was identified. Higher body weight and female sex were found to be negative predictors of serum concentration and therapeutic response, respectively. No significant effects of other predictors (i.e., age, psychotropic co-medication, main diagnostic group, co-morbidities and nicotine use) were observed. The longitudinal analysis largely paralleled the findings using

the last datapoints. The reference range of the active moiety for responders to fluoxetine for depression that could be derived from this study was 201.5–306 ng/ml.

Conclusions: This study identified a clear dose–serum concentration association for fluoxetine in youth and found predictors of potential clinical relevance. The lack of significant relationships between serum concentration and clinical/adverse effects may be owing to uncontrolled confounders, a low signal-to-noise ratio and complex interactions influencing pharmacodynamics. Future studies should further evaluate and isolate specific factors contributing to clinical responses to antidepressants.

Submission ID 68: How does religiosity affect the anxiety levels amongst the students – results of an international survey

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- **Abstract topic:** COVID-19, stress and anxiety
- **Type of presentation:** Onsite Poster

Objectives:

The study aims to assess the relationship between the religiosity and intensity of anxiety of students from seven countries during the COVID-19 pandemic. We aimed to present whether religious practices of different religions might be protective factors regarding students' emotional well-being.

Methods:

An online cross-sectional survey was distributed amongst the Polish (N = 1196), Bengali (N = 1537), Indian (N = 483), Mexican (N = 231), Egyptian (N = 565), Philippine (N = 2062), and Pakistani (N = 506) students (N = 6580). The survey was opened on 12th April and closed on 1st June 2021. Respondents' religiosity was measured by The Duke University Religion Index (DUREL) while to assess the emotional distress, the Depression, Anxiety, and Stress Scale-21 (DASS-21) was used.

Results:

A group of 6580 students was divided into atheists (N = 756), Christians (N = 2840), Muslims (N = 2391), and Hindu (N = 593). Regarding attending the temple, it were Muslims who mostly attended (Me = 5.00 ± 2.16) followed by Hindu (Me = 3.00 ± 1.51), Christians (Me = 3.00 ± 1.37), and atheists (Me = 1.00 ± 1.42). It were Hindu students who were mostly practicing religious activities (Me = 4.00 ± 4.15) followed by atheists (Me = 4.00 ± 0.99),

Christians (Me = 3.00 ± 1.48), and Muslims (Me = 2.00 ± 1.43). Differences between the groups were statistically significant (H = 508.665, p < 0.0001). Further, Christians showed more involvement in religious practices than Muslims (p < 0.0001). The highest level of religious belief or experience was declared by Muslims (Me = 15.00 ± 3.70), Christians (Me = 10.00 ± 3.36), and Hindu (Me = 9.00 ± 3.25) while much lower amongst the atheists (Me = 3.00 ± 2.31). The study groups were statistically different (H = 2138.46, p < 0.0001). Muslims showed higher religious belief or experience than both - Hindu and Christians (p < 0.0001). Regarding anxiety, the highest levels were presented among Christians (Me = 12.00 ± 10.65) and atheists (Me = 12.00 ± 11.13) (it was moderate anxiety in both cases) while the lowest by Muslims (Me = 4.00 ± 9.75) and Hindu (Me = 4.00 ± 8.74), interpreted as mild anxiety in both cases.

Conclusions:

Considering the lowest anxiety levels among Muslims and Hindu, it might be assumed that attending the temple, practicing religious activities, and religious beliefs and experiences might act as protective factors in improving students' emotional well-being during the COVID-19 pandemic specifically. Regarding the results of the atheists, they are surprising given the declarations of the lack of any religious beliefs. Nevertheless, it might be concluded that this particular group, even though declaring no religious beliefs, could have probably tried to treat some religious activities as a protective factor in the face of a crisis situation such as the COVID-19 pandemic.

Submission ID: 75

- **Authors:** *Marina Zulauf Logoz and Florian Kraemer and Rita Grolimund and Michal Teichman and Veronika Mailaender Zelger and Gudrun Seeger-Schneider and Maurizia Franscini and Dagmar Pauli and Susanne Walitza*
- **Affiliation details: department, institution / hospital, city, state (if relevant), country:** Psychiatric university hospital of Zurich, department of child and adolescent psychiatry
- **Abstract topic:** Stress and anxiety in children and adolescents
- **Type of presentation:** Onsite Poster

Outpatient Clinic 0-5: Early Childhood consultation in the Psychiatric University Hospital Zurich, Switzerland.

Introduction:

We would like to report on the development and implementation of our Early childhood consultation at the Psychiatric University Hospital Zurich, Switzerland. 14-26% of all children of preschool age (2.5 years) show clinically relevant disorders (Egger & Angold, 2006a). Of these, 10% are emotional disorders, predominantly anxiety disorders, and 9% are various externalizing disorders. The latter in particular often show a persistent course into adulthood. Anxiety disorders that begin at an early age also often run a chronic course if left untreated and comorbid disorders often develop. Approximately 5% of all children suffer from oppositional defiant disorder/social behavior disorder, and this generally represents the most common reason for referral to child psychiatric/psychological treatment (NICE, 2013).

The main causes of the development of oppositional and aggressive behaviors in early childhood are inconsistent parenting and lack of control, combined with decreased attention to children's prosocial behavioral approaches (Döpfner, 2009). This poses a high psychosocial risk for families and additionally increases the risk for children's mental health.

Purpose of the work:

Thus, there was a need to develop sustainable and evidence-based services for families with young children in our child and adolescent psychiatry clinic as well, including primary, indicated and secondary prevention and age-specific intervention methods / therapy.

Description of the project:

-Indications of our target group are:

Regulatory disorder, Developmental disorders in the social-emotional area, Interaction disorder (with parents, siblings, peers), early manifestations of child psychiatric disorders.

-Assignment by concerned parents themselves or by professionals.

-Our consultation includes:

Diagnosis and intervention in early childhood between 0 and 5; early detection of abnormalities; improving parenting and interaction skills e.g. implementing Parent-Child-Interaction Therapy PCIT; Improving the parent-child relationship and thus promotion of the child's development in all areas; early intervention in case of "suspected diagnosis" of autism, favorable influence on the course of childhood disorders in general.

Results:

In the first half of 2023 we were contacted for more than 70 children under 6 years. About 50 children were admitted and seen. We will report on the distribution of their problems, sample characteristics, diagnostics and interventions.

Submission ID: 76

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- **Abstract topic:** Stress and anxiety in children and adolescents
- **Type of presentation:** Onsite Poster

Background: Infant temperament is one of the earliest indicators of later developmental difficulties. The interaction between maternal depression and anxiety, and the developmental course of infant temperament over time is not well explored. This study explored trajectories of infant temperament from 6 weeks after delivery to 18 months and the associations between maternal symptoms of depression and anxiety in pregnancy and postpartum and infant temperament trajectories. Method: Data from 1,687 mother-infant dyads from the Uppsala (Sweden) BASIC cohort (“Biology, Affect, Stress, Imaging and Cognition in pregnancy and puerperium”) and the followup study (U-BIRTH) were used. Maternal depressive and anxiety symptoms were assessed via the Edinburgh Postnatal Depression Scale (EPDS & EPDS-3A) during pregnancy at gestational weeks 17/32, and postpartum at week 6. Difficult infant temperament was defined from the Infant Characteristics Questionnaire (6 weeks), subscales of the Toddler Behavior Questionnaire (TBQ) (12 months) and the very short form of the Early Childhood Behavior Questionnaire (18 months). Difficult infant temperament trajectories were calculated via Group-Based Trajectory Modeling. Multinomial regression was employed for the associations between maternal variables and temperament trajectories. Results: The trajectories “stable low”, “stable medium” and “high rising” difficult temperament were identified. Higher anxiety scores prenatally were associated with having an infant in the high rising difficult temperament trajectory, while the depressive/anhedonia subscale was associated with the stable medium temperament trajectory. The association between prenatal anxiety and the high rising trajectory stayed significant after adjusting for postpartum anxiety, while the association with depression/anhedonia got attenuated when adjusting for postpartum depression/anhedonia. Sex specific effects were found with girls being more vulnerable towards maternal anxiety during pregnancy and boys towards maternal postpartum depression. Conclusion: Effects on infant temperament by maternal mood vary, depending on the timing (pre- or postpartum), type of symptoms (depression/anhedonia vs. anxiety) and sex of the infant.

Type of presentation: Eposter

Submission ID 31: Prevention effects after six and twelve months of the transdiagnostic online CBT program “Learn to Manage your Emotions” (AMtE) on pathological worry, anxiety sensitivity, emotional avoidance and affect in adolescents with anxiety and/or depressive symptoms

- **Authors:** *Julia C. Schmitt and Schmitt, Julia C. and Valiente, Rosa M. and García-Escalera, Julia and Sandín, Bonifacio and Arnáez, Sandra and Espinosa, Victoria and Chorot, Paloma*
- **Affiliation details: department, institution / hospital, city, state (if relevant), country:** Department of Personality, Assessment and Psychological Treatment, Faculty of Psychology, Universidad Nacional de Educación a Distancia (UNED), Madrid, Spain
- **Abstract topic:** Stress and anxiety in children and adolescents
- **Type of presentation:** Eposter

Transdiagnostic cognitive behavior therapy intends to treat common vulnerability and maintenance factors for groups of disorders. Intervening as early as possible, with long-lasting effects and overcoming barriers to traditional intervention formats seems important to avoid the negative consequences of anxiety and depressive disorders. The program Learn to Manage your Emotions (Aprende a Manejar tus Emociones; AMtE) represents the first online adaptation of the Unified Protocol for Transdiagnostic Treatment of Emotional Disorders in Adolescents and the first transdiagnostic online program for the prevention of anxiety and depressive disorders in adolescents. It consists of 8 modules and focuses on emotion regulation strategies. The aim of the present study was to examine the prevention effects after six and twelve months of AMtE on pathological worry, anxiety sensitivity, emotional avoidance and affect in adolescents with subthreshold anxiety and/or depressive symptoms. Thirty adolescents (56.7% females, age range = 12–18 years, Mage = 14.00, SDage = 1.89) with subclinical levels of anxiety and/or depression referred by school counselors participated in the pre-treatment assessment after completing a series of screening questionnaires and attending a clinical interview. Furthermore, participants completed AMtE (in the current study, adolescents and one parent involved in the program received weekly therapist support by phone), post-treatment, three-month, six-month and twelve-month follow-up assessments. Results until the three-month follow-up can be looked up in Schmitt et al. (2022). Friedman and Wilcoxon test intention-to-treat (N = 30) and completer (those who took part in the twelve-month follow-up assessment, n = 16) analyses were carried out (pre-treatment vs. six-month follow-up vs. twelve-month follow-up). A significant decrease in pathological worry from pre-treatment to six-month follow-up (Mpre = 26.00, SDpre = 7.32, M6months = 21.44, SD6months = 9.47; Z = -2.28, p = .030, d = 0.53) and a trend towards significance from pre-treatment to twelve-month follow-up (Mpre = 26.00, SDpre = 7.32, M12months = 22.00, SD12months = 10.13; Z = -1.99, p = .069, d = 0.44) could be revealed in the completer sample. Friedman tests showed a trend towards significance for positive affect in both intention-to treat [Mpre = 22.20, SDpre = 3.45, M6months = 23.47, SD6months = 3.79, M12months = 22.97, SD12months = 3.97; $\chi^2(2) = 5.81$, p = .055] and completer [Mpre = 21.31, SDpre = 3.74, M6months = 23.94, SD6months = 4.04, M12months = 23.00, SD12months = 4.43; $\chi^2(2) = 5.32$, p = .070] samples, for anxiety sensitivity in the completer sample [Mpre = 25.88, SDpre = 5.30, M6months = 24.00,

SD6months = 6.19, M12months = 24.19, SD12months = 5.69; $\chi^2(2) = 5.21$, $p = .074$], and for pathological worry in the total sample [Mpre = 23.23, SDpre = 8.27, M6months = 20.37, SD6months = 8.89, M12months = 20.67, SD12months = 9.30; $\chi^2(2) = 5.55$, $p = .062$]. Results imply potential long-term prevention effects of AMtE on transdiagnostic variables, which represent vulnerability and maintenance factors for anxiety and depressive disorders, in subclinical adolescents. Randomized controlled trials should be considered as a next step to consolidate and extend the results.

Keywords: transdiagnostic; AMtE; anxiety; depression; long-term follow-up; emotion regulation; adolescents; indicated prevention; internet-delivered CBT; UP-A

Submission ID: 36

- **Authors:** *Victoria Espinosa Lorenzo and Victoria Espinosa Lorenzo and Sandra Arnáez and Julia García-Escalera and Rosa M. Valiente and Bonifacio Sandín and Julia C. Schmitt and Paloma Chorot*
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- **Abstract topic:** Stress and anxiety in children and adolescents
- **Type of presentation:** Eposter

Title: Effects on self-reported anxiety and depressive symptoms of the self-applied transdiagnostic online program Learn to Manage your Emotions (AMtE) in clinical adolescents: A randomized controlled trial

Abstract body: One of the most noteworthy effects of the COVID-19 pandemic was its impact on symptoms of anxiety and depression in young people. However, many adolescents with emotional disorders do not benefit from evidence-based psychological treatments. Transdiagnostic internet-delivered cognitive behavior therapy is a new and promising approach, which attempts to address the comorbidity between anxiety and depressive disorders and the barriers of access to evidence-based CBT. Learn to Manage your Emotions [Aprende a Manejar tus Emociones, AMtE], is the first transdiagnostic, internet-delivered intervention designed to tackle anxiety and depressive symptoms in adolescents. This two-arm randomized controlled trial examined the efficacy of the self-applied program AMtE compared to the Unified Protocol for Transdiagnostic Treatment of Emotional Disorders in Adolescents (UP-A) applied face-to-face via telehealth for the treatment of emotional disorders in adolescents with an anxiety and/or depressive disorder. School counselors referred adolescents with emotional vulnerabilities. The total sample consisted of fifty-eight adolescents (82% females, age range: 12–18 years, Mage = 14.93, SDage = 1.83) who met the inclusion criteria. Several self-report questionnaires were administered at pre-treatment, post-treatment and three-month follow-up. In addition, participants were invited to complete a diagnostic interview before and after treatment. Intention-to-treat analyses (repeated measures ANOVAs) revealed that AMtE and UP-A showed significant improvements or trends towards significance over time in self-rated anxiety and depressive symptoms, except for symptoms of separation anxiety disorder in the AMtE condition. Most of these effects were associated with large effect sizes ($\eta^2 = .16 - .31$ for AMtE and $\eta^2 = .22 - .37$ for the UP-A). Based on ANCOVAs, no differences were found between the treatment conditions, evidencing similar significant improvements. No effect of time (post-treatment vs. follow-up) was observed either, revealing that the gains were maintained across time in both groups. However, a trend towards a significant condition x time interaction effect for major depressive (RCADS-30MDDscore; $F(1, 55) = 3.38, p = .071, \eta^2 = .06$) and obsessive-compulsive disorder symptoms (RCADS-30OCDscore; $F(1, 55) = 3.03, p = .087, \eta^2 = .05$) was observed, suggesting that AMtE participants displayed greater changes in these outcomes at three-month follow-up compared to those in the UP-A condition. Results provide evidence of the

efficacy of AMtE for the treatment of adolescents diagnosed with anxiety and/or depressive disorders. An innovative and important implication of this investigation is that AMtE is as effective as the UP-A for the treatment of anxiety and depressive disorders in adolescents, since the UP-A is a well consolidated transdiagnostic program for this population.

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Submission ID: 38

- **Authors:** *Victoria Espinosa Lorenzo and Victoria Espinosa Lorenzo and Julia García-Escalera and Sandra Arnáez and Rosa M. Valiente and Bonifacio Sandín and Julia C. Schmit and Paloma Chorot*
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- **Abstract topic:** Stress and anxiety in children and adolescents
- **Type of presentation:** Eposter

Title: Clinically significant change based on clinician-rated measures after the self-applied transdiagnostic online program Learn to Manage your Emotions (AMtE) for the treatment of emotional disorders in adolescents: A randomized controlled trial. Abstract body: The aim of this study was to test the efficacy of the self-applied transdiagnostic online program Learn to Manage your Emotions (Aprende a Manejar tus Emociones; AMtE), the first transdiagnostic internet-delivered intervention program created to reduce anxiety and depressive symptoms in adolescents, to produce clinical significant change, in a sample of adolescents with emotional disorders. A two-armed randomized controlled trial was conducted. Fifty-eight adolescents (82% females, age range: 12–18 years, Mage = 14.93, SDage = 1.83), who met the diagnostic criteria, participated in this study. The most common primary diagnosis was social phobia (n = 18, 31%), and more than half of the participants (n = 31, 53.4%) had at least one comorbid diagnosis. Participants randomly received AMtE (experimental condition) or the Unified Protocol for Transdiagnostic Treatment of Emotional Disorders in Adolescents (UP-A; applied face-to-face via telehealth, control condition). They were assessed at pre-treatment, post-treatment, and three-month follow-up, through a structured clinical interview and a clinician-rated scale that assesses symptom severity (CGI-S). Based on the clinicians' severity ratings, participants were classified as responders (≥ 2 points decrease compared to pre-treatment or a clinician-rated symptom severity score of ≤ 3) or non-responders. Intention-to-treat analysis (ANOVAs) revealed significant overall improvements in clinician-rated anxiety and depressive disorder symptom severity between the time points in both conditions (AMtE: $F(2,54) = 28.31, p < .001$; UP-A: $F(2,58) = 44.75, p < .001$) with large effect sizes (AMtE: $\eta^2 = .51$; UP-A: $\eta^2 = .61$). Within-group comparisons indicated significant pre-post and pre-follow-up reductions with large effect sizes in both groups (AMtE: $d = 1.22-1.87$; UP-A: $d = 1.54-1.70$). In addition, univariate ANCOVAs at post-treatment and three-month follow-up did not reveal an effect of condition, showing the equivalence of both groups. No effect of time (post-treatment vs. follow-up) was found either, revealing that the decrease in symptom severity was maintained at three-month follow-up in both groups. Regarding treatment response, at post-treatment, 15/24 (62.5%) in the experimental condition (AMtE) and 19/26 (73.1%) in the control condition (UP-A) were classified as responders representing non-significant differences between both conditions [$\chi^2(1) = .64, p = .423$]. At follow-up, 20/22 (90.9%) met the criteria for response in the AMtE group, whereas 20/25 (87%) were

responders in the UP-A group. These differences were not significant [$\chi^2(1) = .18, p = .673$]. Additionally, based on the clinical interviews conducted after the intervention, no significant differences were found in the number of participants who no longer had a diagnosis [$\chi^2(1) = .28, p = .600$], being 54.3% of the cases in the AMtE and 61.5% in the UP-A group. We neither observed significant differences in the number of comorbid diagnoses between conditions after the intervention [$\chi(1)^2 = .01, p = .999$]. The findings provide evidence that AMtE can lead to clinically significant changes in adolescents with anxiety and depressive disorders. Transdiagnostic self-applied online programs such as AMtE could represent important progress in the field of youth psychopathology as many researchers have found evidence that comorbidity is predictive of poorer response to interventions.

Submission ID: 39

- **Authors:** *Sonja Maria Kagerer and Awasthi, Swapnil and Ripke, Stephan and Maceski, Aleksandra and Benkert, Pascal and Fall, Aida and Riederer, Peter and Fischer, Peter and Walitza, Susanne and Grünblatt, Edna and Kuhle, Jens and Unschuld, Paul Gerson*
- **Affiliation details: department, institution / hospital, city, state (if relevant), country:** Department of Geriatric Psychiatry, Psychiatric University Hospital Zurich, Zurich, Switzerland
- **Abstract topic:** Neurodegenerative disorders
- **Type of presentation:** Eposter

Title: Association of polygenic risk for Alzheimer's Disease with blood-based biomarkers of neurodegeneration prior to manifestation of dementia.

Objectives: Establishing valid blood-based diagnostic strategies is a precondition for successful prevention and early therapeutic intervention in Alzheimer's Disease (AD). This study aimed at evaluating the predictive value of plasma Neurofilament light chain (NfL) and polygenic risk score (PRS) for the development of AD in a prospective study over 7.5 years.

Methods: 144 healthy 75-year-old participants from the Vienna-Transdanube-Aging (VITA) longitudinal cohort study were tested for: 1) neuroaxonal damage by single molecular array plasma NfL levels at baseline, 30-, 60- and 90-months. 2) Individual risk for sporadic AD, as estimated by PRS, calculated from genome-wide association study (GWAS) data. 3.) Presence of AD-dementia after 90 months.

Results: 19 participants developed AD after 90 months. Plasma NfL increased significantly over 90 months in all participants (AD: $p < 0.0001$; non-AD: $p = 0.002$). In the AD group baseline NfL plasma levels correlated with PRS ($r = 0.47$, $p = 0.044$). This relationship was not observable in the non-AD group ($r = 0.14$, $p = 0.11$; Fisher's r -to- z : $z = 2.45$, $p = 0.014$).

Conclusions: Our data suggest that individuals at increased genetic risk for sporadic AD might particularly benefit from assessing plasma NfL as diagnostic marker.

Submission ID 40: Virtual Reality in Therapy for Music Performance Anxiety

- **Authors:** *Daniel Bellinger and Deckert, Jürgen and Herrmann, Martin Josef and Wehrmann, Kristin and Schuppert, Maria and Erhardt-Lehmann, Angelika and Gall, Dominik and Störk, Stefan and Jost-Flohr, Michael and Pauli, Paul*
- **Affiliation details: department, institution / hospital, city, state (if relevant), country:** Department of Psychiatry, Psychosomatics, and Psychotherapy, Center for Mental Health, University Hospital Würzburg, Germany
- **Abstract topic:** Stress and anxiety in children and adolescents
- **Type of presentation:** Eposter

Objective: Music performance anxiety (MPA) can be defined as a subentity of social fears and is considered a common problem among musicians. Unlike to normal stage fright, MPA affects the musical performance with a significant impact on the artistic career and/or the well-being of the individual. Typical symptoms of MPA are amongst others the consequences of an increase in sympathetic tone with cardiac stress like an acceleration of heartbeat and blood pressure. The therapy of choice for anxiety disorders is cognitive-behavioral therapy with exposure. Hardly any therapy studies so far are applying virtual reality exposure on MPA.

Methods: We have designed a prospective, randomized and controlled clinical trial with a pre-post design and a follow-up after 6 months to analyze the effects of exposure treatment in virtual reality (VRET) for musicians with performance anxiety. Furthermore, we are investigating the therapy outcome and cardiovascular changes throughout the course of the therapy using a behavioral assessment test in virtual reality. At least 30 (semi)-professional musicians including music student will be recruited and randomized into a exposure-therapy group using virtual reality or a control group receiving progressive muscle relaxation, both over 4 single sessions. Results: Since the study is currently still ongoing, the data collection will be expected to be finished by March 2024. So far, we have carried out the therapy training with 22 musicians.

Conclusion: We expect a reduction of anxiety but also a consecutive improvement of the heart rate variability with cardiovascular protective effects. We hope this study to give information about whether virtual reality can be a necessary tool in the treatment or prevention of music performance anxiety.

Submission ID 43: Can Personality Traits and Trait Emotional Intelligence Explain Reduced Effects of Burnout among Physicians in Pakistan?

- **Authors:** *Dr. Hina Ghafoor* and *Rana Altaf Ahmad* and *Stefan M. Schulz*
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- **Abstract topic:** Burn-out-syndrome
- **Type of presentation:** Eposter

Physicians often have to work in stressful conditions like emergency situations. Economic and socio-cultural pressure in their everyday lives can further amplify stress at the workplace. Individual personality characteristics influence their response to stress. Similarly, trait emotional intelligence (EI) could be a factor underlying the individual ability to identify coping strategies and implement specific coping strategies for dealing with stress.

The current study has examined the role of the Big Five personality traits and trait EI for levels of burnout among physicians in Pakistan. In a cross-sectional survey research design N = 149 physicians (Males n = 42, Females n = 107) were recruited through purposive sampling. A set of psychological questionnaires (demographics included) were administered to collect the data.

The results indicate that lower trait emotional intelligence was associated with higher burnout-levels ($r = -.315, p \leq .01$). Similarly, among the Big Five, higher neuroticism ($r = .195, p \leq .05$) and lower agreeableness ($r = -.282, p \leq .01$) as well as lower openness ($r = -.210, p \leq .05$) were related to higher levels of burnout among physicians. Multiple regression analysis further suggested that trait EI appears to support processes, for example active coping, that lead to reduced burnout ($\beta = -.315, R^2 = 0.09, p \leq .001$).

The findings of the current study emphasized the importance of raising awareness among clinical psychologist and physicians to help one to develop coping strategies particularly for dealing with effects (strengths and weaknesses) resulting from one's individual personality profile.

Keywords: Physician's burnout, Trait emotional intelligence, Personality traits, coping strategies

Submission ID 69: The effect of mindfulness on the quality of life of individuals with anxiety-related disorders: A systematic review and meta-analysis

- **Authors:** *Leonardo Fontenelle* and *Pedro P Fortes* and *Juliana B de-Salles-Andrade* and *Samara dos-Santos-Ribeiro* and *Maria E Moreira-de-Oliveira* and *Flávia de-Abreu-Cervone* and *Livi Faro* and *Bianca Torres* and *Gabriela B de-Menezes*
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- **Abstract topic:** Management of stress and anxiety
- **Type of presentation:** Eposter

BACKGROUND: Although meta-analyses demonstrate the effectiveness of mindfulness-based interventions (MBIs) on people with different anxiety disorders, we are not aware of studies that evaluate the effectiveness of MBIs on their quality of life (QoL). **Objective:** In this meta-analysis, we investigated the effectiveness of MBIs in improving QoL in individuals diagnosed with anxiety related disorders (ARDs), including panic disorder, social anxiety disorder, generalized anxiety disorder, obsessive-compulsive disorder, and post-traumatic stress disorder. **METHODS:** This review is registered with PROSPERO (CRD42021259255). Systematic searches were performed in five databases: MEDLINE, EMBASE, PsycINFO, ISI Web of Science, and Clinical Trials Register. We only selected randomized controlled trials (RCTs) that investigated individuals with ARDs as a population, MBIs as an interventions, and QoL as an outcome. The risk of bias was assessed using the ROB 2 tool. The Comprehensive Meta-Analysis statistical software was used. **RESULTS:** Database search identified 688 records. After excluding the duplicates and evaluating the titles and abstracts, 32 full texts were assessed in more detail. We then selected 14 RCTs that included 1.130 participants. Studies were groups into three subgroups according to the type of control group, namely: inactive controls, active control gold standard interventions (GSIs), i.e., medication and cognitive behaviour therapy, and active control non-gold standard interventions (NGSIs), i.e., psychoeducation. When all subgroups were evaluated together, we found that the effect of MBIs on QoL was positive but without statistical significance (SMD = 0.133, $p = 0.051$). This analysis had a moderate heterogeneity, with an $I^2 = 47.635$ ($Q = 19.097$, $df = 10$, $p = 0.039$). When we evaluated each subgroup separately, we found a positive effect size (ES) of the MBIs compared to inactive controls with statistical significance (SMD = 0.517, CI [0.147, 0.888], $p = 0.006$) and a negative ES of the MBIs compared to GSIs without statistically significance (SMD = - 0.176, 95% CI [-0.457 - 0.106], $p = 0.221$). Because the NGSI subgroup study had a biased RCT, we decided to perform a sensitivity analysis without this study, which showed MBIs to have a statistically significant positive ES in relation to the NGSIs (SMD = 0.213, 95 % CI [0.053 - 0.372], $p = 0.009$). In the follow-up, a positive ES with statistical significance was found when all subgroups were evaluated together (SMD = 0.370, 95% CI [0.124, 0.616], $p =$

0.003). CONCLUSION: This meta-analysis's results suggest that MBIs may effectively improve QoL in individuals with ARDs. However, more studies with larger samples and less heterogeneity are needed for a more robust conclusion.

Submission ID 77: Effects on self-reported anxiety and depressive symptoms of the self-applied transdiagnostic online program Learn to Manage your Emotions (AMtE) in clinical adolescents: A randomized controlled trial

- **Authors:** *Julia C. Schmitt and Victoria Espinosa and Julia García-Escalera and Sandra Arnáez and Rosa M. Valiente and Bonifacio Sandín and Julia C. Schmitt and Paloma Chorot*
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- **Abstract topic:** Stress and anxiety in children and adolescents
- **Type of presentation:** Eposter

One of the most noteworthy effects of the COVID-19 pandemic was its impact on symptoms of anxiety and depression in young people. However, many adolescents with emotional disorders do not benefit from evidence-based psychological treatments. Transdiagnostic internet-delivered cognitive behavior therapy is a new and promising approach, which attempts to address the comorbidity between anxiety and depressive disorders and the barriers of access to evidence-based CBT. Learn to Manage your Emotions [Aprende a Manejar tus Emociones, AMtE], is the first transdiagnostic, internet-delivered intervention designed to tackle anxiety and depressive symptoms in adolescents.

This two-arm randomized controlled trial examined the efficacy of the self-applied program AMtE compared to the Unified Protocol for Transdiagnostic Treatment of Emotional Disorders in Adolescents (UP-A) applied face-to-face via telehealth for the treatment of emotional disorders in adolescents with an anxiety and/or depressive disorder. School counselors referred adolescents with emotional vulnerabilities. The total sample consisted of fifty-eight adolescents (82% females, age range: 12–18 years, $M_{age} = 14.93$, $SD_{age} = 1.83$) who met the inclusion criteria. Several self-report questionnaires were administered at pre-treatment, post-treatment and three-month follow-up. In addition, participants were invited to complete a diagnostic interview before and after treatment.

Intention-to-treat analyses (repeated measures ANOVAs) revealed that AMtE and the UP-A showed significant improvements or trends towards significance over time in self-rated anxiety and depressive symptoms, except for symptoms of separation anxiety disorder in the AMtE condition. Most of these effects were associated with large effect sizes ($\eta^2 = .16-.31$ for AMtE and $\eta^2 = .22-.37$ for the UP-A). Based on ANCOVAs, no differences were found between the treatment conditions, evidencing similar significant improvements. No effect of time (post-treatment vs. follow-up) was observed either, revealing that the gains were maintained over time in both groups. However, a trend towards a significant condition x

time interaction effect for major depressive (RCADS-30MDDscore; $F(1, 55) = 3.38, p = .071, \eta^2 = .06$) and obsessive-compulsive disorder symptoms (RCADS-30OCDscore; $F(1, 55) = 3.03, p = .087, \eta^2 = .05$) was observed, suggesting that AMtE participants displayed greater changes in these outcomes at three-month follow-up compared to those in the UP-A condition.

Results provide evidence of the efficacy of AMtE for the treatment of adolescents diagnosed with anxiety and/or depressive disorders. An innovative and important implication of this investigation is that AMtE is as effective as the UP-A for the treatment of anxiety and depressive disorders in adolescents, since the UP-A is a well consolidated transdiagnostic program for this population.

Submission ID 78: Clinically significant change based on clinician-rated measures after the self-applied transdiagnostic online program Learn to Manage your Emotions (AMtE) for the treatment of emotional disorders in adolescents: A randomized controlled trial

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The aim of this study was to test the efficacy of the self-applied transdiagnostic online program Learn to Manage your Emotions (Aprende a Manejar tus Emociones; AMtE), the first transdiagnostic internet-delivered intervention program created to reduce anxiety and depressive symptoms in adolescents, to produce clinically significant change, in a sample of adolescents with emotional disorders. A two-armed randomized controlled trial was conducted. Fifty-eight adolescents (82% females, age range: 12–18 years, $M_{age} = 14.93$, $SD_{age} = 1.83$), who met the diagnostic criteria, participated in this study. The most common primary diagnosis was social phobia ($n = 18$, 31%), and more than half of the participants ($n = 31$, 53.4%) had at least one comorbid diagnosis. Participants randomly received AMtE (experimental condition) or the Unified Protocol for Transdiagnostic Treatment of Emotional Disorders in Adolescents (UP-A; applied face-to-face via telehealth, control condition). They were assessed at pre-treatment, post-treatment, and three-month follow-up, through a structured clinical interview and a clinician-rated scale that assesses symptom severity (CGI-S). Based on the clinicians' severity ratings, participants were classified as responders (≥ 2 points decrease compared to pre-treatment or a clinician-rated symptom severity score of ≤ 3) or non-responders. Intention-to-treat analyses (ANOVAs) revealed significant overall improvements in clinician-rated anxiety and depressive disorder symptom severity between the time points in both conditions (AMtE: $F(2,54) = 28.31$, $p < .001$; UP-A: $F(2,58) = 44.75$, $p < .001$) with large effect sizes (AMtE: $\eta^2 = .51$; UP-A: $\eta^2 = .61$). Within-group comparisons indicated significant pre-post and pre-follow-up reductions with large effect sizes in both groups (AMtE: $d = 1.22$ - 1.87 ; UP-A: $d = 1.54$ - 1.70). In addition, univariate ANCOVAs at post-treatment and three-month follow-up did not reveal an effect of condition, showing the equivalence of both groups. No effect of time (post-treatment vs. follow-up) was found either, revealing that the decrease in symptom severity was maintained at three-month follow-up in both groups. Regarding treatment response, at post-treatment, 15/24 (62.5%) in the experimental condition (AMtE) and 19/26 (73.1%) in the control condition (UP-A) were classified as responders representing non-significant differences between both conditions [$\chi^2(1) = .64$, $p = .423$]. At follow-up, 20/22 (90.9%) met the criteria for response in the AMtE group, whereas 20/25 (87%) were responders in the UP-A group. These differences were also not significant [$\chi^2(1) = .18$, $p = .673$]. Additionally, based on the clinical interviews conducted after the intervention, no

significant differences between conditions were found in the number of participants who no longer had a diagnosis [$\chi^2(1) = .28, p = .600$], being 54.3% of the cases in the AMtE and 61.5% in the UP-A group. We neither observed significant differences in the number of comorbid diagnoses between conditions after the intervention [$\chi^2(1) = .01, p = .999$]. The findings provide evidence that AMtE can lead to clinically significant changes in adolescents with anxiety and depressive disorders. Transdiagnostic self-applied online programs such as AMtE could represent important progress in the field of youth psychopathology as many researchers have found evidence that comorbidity is predictive of poorer response to interventions.

