

R&D Theme

Visualization of the Art Intervention Effects

Progress until FY2025

1. Outline of the project

The aim of this study is to establish objective endocrine and psychophysiological indicators that capture the improvement in mental well-being and social curiosity resulting from artistic activities, with the goal of providing art activities that allow children and adolescents with challenges in social skills and characteristics associated with Autism Spectrum Disorder (ASD) to enhance their sociability while feeling at ease.

Exploration of art activities that lead to peace of mind and vitality

People with developmental disabilities, such as autism spectrum disorder, at higher risk of school refusal and withdrawal by the difficulties they face

Artistic and creative activities foster resilience as a protective factor and prevent school refusal

Social competence immaturity
Communication difficulties
Failure to build relationships
Sense of inadequacy
Low self-esteem

Social Prescription

No medicines

Visualising the effects of art workshops through physiological, behavioural and psychological indicators.

- Empathy between people with similar characteristics (Komeda, 2014)
- Improved social skills through peer activities (Nitto, 2018)
- Art therapy may contribute to flexible and relaxed attitudes, better self-image, and improved communication and learning skills in children with autism (Schweizer, 2014).

- Prepare the field for conducting face-to-face/remote Art Workshop Sessions (AWS) targeting children and begin collecting data on hormonal fluctuations in saliva.
- Develop a wearable small-scale electrocardiogram measurement system.
- Develop a face-to-face detection app and a motion visualization system.
- Initiate heart rate measurement in face-to-face AWS sessions targeting adults and accelerometer measurement using the face-to-face app, and evaluate the implementation

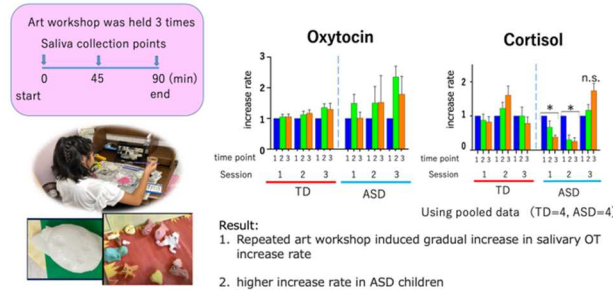
protocol.

- Conduct a questionnaire survey on art activities and enhance the content.

2. Outcome so far

<Art Workshop> Due to the fluctuating impact of

Changes in saliva OT concentration during remote art workshop activities (children)

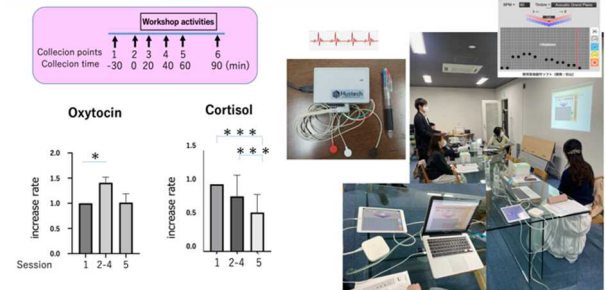


COVID-19, in the 2022 fiscal year, measurements were conducted on the changes in concentrations of hormones such as oxytocin and cortisol in saliva during remote AWS sessions. Psychological and behavioral data were obtained through video recordings, questionnaires, and interviews. The measurement points necessary to capture the fluctuations in oxytocin concentration in saliva were confirmed. Analyzing the changes in oxytocin concentration in saliva before the activity, 30 minutes after the activity started, and after the activity ended during children's participation in remote art activities, it was confirmed that children with ASD showed a higher increase in oxytocin concentration compared to typically developing (TD) children.

<Electrocardiogram Measurement Device> A small wearable electrocardiogram measurement device was developed to remove noise, and a prototype software capable of real-time analysis and

display of heart rate and autonomic nervous system indicators during daily life was completed. Measurements were taken for one week during both art activities and daily life to analyze individual fluctuations in autonomic nervous system activity."

Changes in saliva OT concentration and electrocardiographic measurements during face-to-face art workshop activities (adults)



<Face-to-face Detection App> Efforts are being made to continue development aiming to integrate face-to-face data with vital data.

<Motion Visualization System> Development was conducted for body orientation.

3. Future plans

Based on the research findings, we will organize face-to-face/remote Art Workshop Sessions (AWS) targeting adolescents with ASD characteristics, using optimized art activities. We will analyze the fluctuation values of hormones in saliva, measurement data from the face-to-face detection app and motion visualization system, as well as heart rate variability data, in relation to changes in participant characteristics and satisfaction. We will also examine the usefulness of these indicators in demonstrating the effects of art activities.
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