ASPERGA

ASOCIACIÓN GALEGA DE ASPERGER

REDUCE SENSORIAL PAIN OR STRESS IN AUTISM SPECTRUM

TERESA ANDRADE ROBLES
LAURA GÁNDARA INSUA

01 Introduction

What

Autism spectrum disorder is a neurodevelopmental condition that is characterized by social behavior deficits and inflexible, repetitive patterns of conduct that are present for early life and which result significant limitations inadaptive functioning (APA,2013) One of the most limitative aspect of ASD concerns to sensory abnormalities, which are now included in the DSM 5. ASD has heterogeneous causes but, currently, has been established strong genetic basis.

This project searches for a comfortable support tool that allow the ASD patient to decrease limitations caused to sensory abnormalities.

02 Methods

Who ?

This project start with patients diagnosed with some autism spectrum disorder without intellectual or language impairment and on scholar years, to facilitate the communication of the perception of pain or other sensations and to have patients with exposure to similar stimuli.

INCLUSION CRITERIA	EXLUSION CRITERIA
✓ People diagnosed with some autism spectrum disorder without intellectual or language impairment. (DSM-V).	× People diagnosed with some autism spectrum disorder with intellectual or language impairment. (DSM-V).
✓ Participants aged between 6 and 16 years.	× Participants younger than 6 or older than 16 years.
✓ People who have sensory processing difficulties in relation to the auditory system and that interfere with their daily activities.	× People who do not have sensory processing difficulties in relation to the auditory system and that interfere with their daily activities.

02 Methods

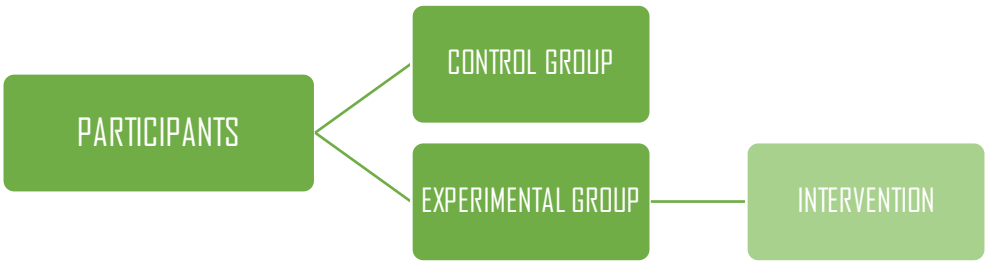
SAMPLE CHARACTERISTICS	VALUE, N (%)
Initial study sample	98 (100)
Initial participants	27 (100)
Final study sample with ASD	14 (100)
Experimental group	10
Control group	4
Age (years)	
Mean (SD)	12,4
Range	6-16
Gender	
Male	11 (78,6)
Female	3 (21,4)
Verbal ability	
Presence of verbal language	14 (100)
Presence of sensory processing difficulties	
Auditory sensory pain	14 (100)

- The initial analysis began with a sample of 98 people.
- After SPM administration, only 30 of the initial 98 subjects met all the inclusion criteria.
- Finally, the sample of 30 subjects was reduced because the mobility reductions decreed by COVID-19 and other reasons.

02 Methods

How ?

This study use an experimental design with a control group in awaiting for intervention, for ethical reasons.

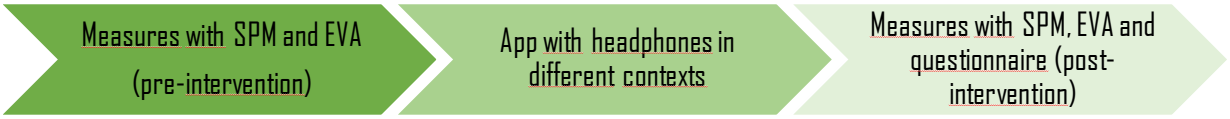


OUTCOMES MEASURES	MATERIAL
• Sensory Processing Measure (SPM): provides a complete picture of children´s sensory processing difficulties • Escala visual analógica de dolor (EVA): scale that evaluates the level of pain intensity from 0 to 10. In this study, sensory pain is measured against auditory stimuli. • Questionnaire for qualitive measures: different context used.	• Frequency generator: android free app emits Hz frequencies. Participants can choose the frecuency to use. • Headphones: bluetooth earphones with a reception range of 10-20 metres to use with the app.

First, we take measures about sensory profile (SPM) and pain auditive experience (EVA).

Next, we have a training session with the patients and their families to learn to use the app and the earphones on the correct way, they should put the application to broadcast on a frequency that makes them feel relaxed before facing painful or annoying situations at the hearing level.

After a minimum of two months of use in your daily life, we carried out a second measurement with the same tests and an interview with the family to collect qualitative data (difficulties of use, context of use, etc.)



03 Results

The results of the test, after of a two-factor analysis, says that listening an auditory frequency in sensory pain moments significantly reduce the pain experience, without improving on sensory procesing or auditive sensory procesing.

3.1. Perception of auditory sensory pain

Tests of inter-subject effects.
Dependent variable: EVA results.

Origin	Sum of Squares Type III	gl	Square root	F	Sig.
Corrected model	95,300[a]	3	31,767	11,560	,000
Intersection	1495,032	1	1495,032	544,060	,000
Time	32,232	1	32,232	11,730	,002
Group	14,175	1	14,175	5,158	,032
Time * Group	15,089	1	15,089	5,491	,028
Error	65,950	24	2,748		
Total	1843,000	28			
Corrected Total	161,250	27			

a. R squared = ,591 (R squared adjusted = ,540)

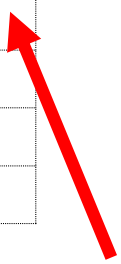
All those results < 0.05 are considered significant; therefore, it is concluded that there is a significant difference both between the pre-intervention and post-intervention measures (time) and between the control and experimental groups.

3.2. Sensory processing

Tests of inter-subject effects.
Dependent variable: Sensory processing.

Origin	Sum of Squares Type III	gl	Square root	F	Sig.
Corrected model	225,414[a]	3	75,138	2,479	,085
Intersection	115628,929	1	115628,929	3815,612	,000
Time	,914	1	,914	,030	,864
Group	223,214	1	223,214	7,366	,012
Time * Group	2,057	1	2,057	,068	,797
Error	727,300	24	30,304		
Total	137314,000	28			
Corrected Total	952,714	27			

a. R squared = ,237 (R squared adjusted = ,141)



All those results < 0.05 are considered significant; therefore, it is concluded that there isn`t a significant difference both between the pre-intervention and post-intervention measures (time) and between the control and experimental groups.

3.3. Auditory sensory processing

Tests of inter-subject effects.
Dependent variable: Auditory sensory processing.

Origin	Sum of Squares Type III	gl	Square root	F	Sig.
Corrected model	51,464[a]	3	17,155	1,074	,379
Intersection	108665,200	1	108665,200	6800,430	,000
Time	2,800	1	2,800	,175	,679
Group	32,914	1	32,914	2,060	,164
Time * Group	8,229	1	8,229	,515	,480
Error	383,500	24	15,979		
Total	135543,000	28			
Corrected Total	434,964	27			

a. R squared = ,118 (R squared adjusted = ,008)

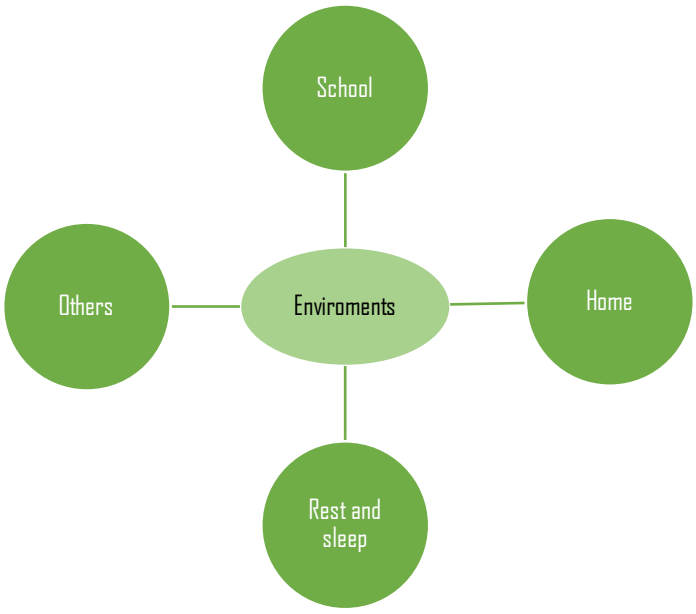
All those results < 0.05 are considered significant; therefore, it is concluded that there isn`t a significant difference both between the pre-intervention and post-intervention measures (time) and between the control and experimental groups.

03 Results

4.Other qualitative results

Participants references

The qualitative information provided by patients and their families informs us of the successful use of the tool in different contexts, such as home, school or before bed, as well as other contexts such as a walk or even a wedding.



04 Discussion

This study confirms that the use of an auditory frequency can reduce the stress or sensory pain suffered by autistic people when faced with certain auditory stimuli.

These results should be interpreted with caution due to the following limitations. The main limitation was the small number of the final sample of participants, so the results may not be generalized to the rest of people with ASD in that age range in Spain. Another limitation was the need for greater training in the use of the device, so that the number of participants who dropped out of the study due to difficulties in handling the tool was less.

Finally, this study does not include intervention follow-ups over a longer period of time, since these evaluations could determine the existence of significant differences in the regulation of auditory sensory processing difficulties.

It is relevant to carry out future research to overcome the mentioned limitations. Mainly, implement the experimental design in a sample of the largest population in the entire country, in this way being able to generalize the results obtained and guarantee more solid evidence on the effectiveness of this intervention tool.

In conclusion, this research shows that the application of a tool based on determined auditory frequencies is feasible to reduce the stress and pain that certain auditory stimuli produce for people with ASD between 6 and 16 years of age. In this way, guarantee an improvement in the participation of this group in the different contexts of their lives such as the school, domestic and / or other environments.