

### INTRODUCTION

- Williams syndrome is a relatively rare (1 in 7,500) genetic disorder (Strømme et al., 2002) characterized by cognitive delays, relative strengths in linguistic ability, and hypersociable behavior (Martens, Wilson, & Reutens, 2008).
- Individuals with Williams syndrome have exaggerated anxious behaviors about health issues (Einfeld, Tonge, & Florio, 1997).
- A majority of individuals with Williams syndrome also have cardiac defects (Collins, 2013), therefore it is important that accurate vital signs are obtained, specifically their blood pressure.
- Individuals with Williams syndrome also have an affinity to music, so it may be beneficial to use this strength in helping them overcome their anxiety during blood pressure readings.
- Music may help reduce anxiety in pediatric patients undergoing procedures (Klassen, Liang, Tjosvold, Klassen, & Hartling, 2008), for example in children undergoing lumbar punctures (Nguyen, Nilsson, Hellström, & Bengston, 2010) and in children with cerebral palsy receiving acupuncture (Yu, Liu, Li, & Ma, 2009).
- Music may also positively affect an individual's vital signs. A review by Loomba and others showed statistically significant decreases in systolic blood pressure, diastolic blood pressure, and heart rate in adults who received a music intervention (Loomba et al., 2012).

### OBJECTIVES

- To determine if listening to music will decrease blood pressure in children with Williams syndrome.
- To determine if listening to music can reduce anxiety while obtaining the blood pressure measurement in children with Williams syndrome.

Hypothesis: Listening to music will decrease anxiety and blood pressure in children with Williams syndrome.

### METHODS

- Data was collected from 41 participants, recruited during the 2014 Williams Syndrome National Convention, a Williams Syndrome Music Camp, and the Nationwide Children's Hospital Williams Syndrome Clinic.
- Inclusion Criteria: age 7-12 years, confirmed diagnosis of Williams syndrome
- Exclusion Criteria: outside age range
- IRB approval, parental informed consent, and informed assent (participants aged 9-12) years) were obtained.
- Anxiety was measured using the State-Trait Anxiety Inventory, short version (STAIC-S). Participants described their feelings (calm, tense, upset, relaxed, content, worried) ranging from 0 (not at all) to 4 (very much).
- Anxiety was also measured using the FACES scale. Participants were asked to point at the face on how they felt at that time, ranging from 0 (very happy) to 10 (very sad and crying).

# Music Medicine to Reduce Anxiety When Taking Blood Pressure in Children with Williams Syndrome

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# METHODS, CONT.

- Measurements of blood pressure and anxiety were completed at Time #1 and Time completed an unrelated language computer task.
- Participants were randomly assigned to either the Music or No Music group, and asked to wear headphones when blood pressure readings were obtained during Time #1 and Time #2.
- Participants from the Music group selected their music choice from a list created by still wore headphones but did not listen to music.
- The principal investigator was blinded to both groups when obtaining blood pressures with a manual blood pressure cuff.

# RESULTS

### Table 1. Study Demographics

Demographics	Music Group	<b>No Music Group</b>
Number	22	19
Mean Participant Age	8.8 yrs. (1.83)	9.1 yrs. (1.47)
Gender:		
Male	9 (41%)	10 (53%)
Female	13 (59%)	9 (47%)

### Table 2. Blood pressure and anxiety scale results

	Music Group	No Music Group
Mean Blood Pressure Time 1 (Systolic/Diastolic)	110/65	107/65
Mean Blood Pressure Time 2 (Systolic/Diastolic)	105/63	106/63
FACES at Time 1	1.6	0.8
FACES at Time 2	1.7	1.3



#2, within a 15 minute interval. In between blood pressure readings, the participants

the Nationwide Children's Hospital music therapy staff. Those in the No Music group

- Music group (Table 1).

- the FACES scale.

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### RESULTS, CONT.

• There were no significant differences in the demographics between the Music and No

• There was a statistically significant drop in systolic blood pressure in the Music Group from Time 1 to Time 2 (p=0.011) (Table 2). There was no statistically significant difference in systolic blood pressure in the No Music Group.

• There was a statistically significant drop in diastolic blood pressure in the No *Music Group from Time 1 to Time 2 (p=.028)* (Table 2). There was no statistically significant difference in diastolic blood pressure in the Music Group.

There were no statistically significant differences in anxiety based on the STAIC-S or

## DISCUSSION

• We found that listening to music resulted in a decreased systolic blood pressure, but not listening to music resulted in decreased diastolic blood pressure.

• There is a correlation between aortic stiffness and systolic blood pressure (75% of individuals with Williams syndrome have supravalvular aortic stenosis), but there is also a correlation between decreased arterial compliance and diastolic blood pressure (Salaymeh & Banerjee, 2001).

• The STAIC and FACES scales may not accurately reflect anxiety in children with Williams syndrome because of response bias due to their desire to please.

• Further research is needed to determine if music can be an effective part of the standard of care for patients with Williams syndrome in ambulatory practice, to decrease anxiety and have more accurate vital signs.

### REFERENCES

# ACKNOWLEDGEMENTS