

Effects of Parent-Child Play: Lowers Salivary Cortisol and Parent Stress, and Increases Childhood Resiliency

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Background & Introduction

Abstract
This poster highlights outcomes of two randomized control trials examining the impact of a novel model that focuses on building resiliency in children to reduce the impact of childhood adversity, namely: toxic stress. The model translates neurobiology and interpersonal psychology theories into practice using parent/caregiver coaching in family settings to infuse joyful play *between* parents-children into everyday routines.

Background & Introduction
Research has demonstrated the profound effects of toxic stress on children, most especially in early childhood during points of critical brain development.

- Toxic stress impacts range from brain size, plasticity, interhemispheric integration, and especially Hypothalamic-Pituitary-Adrenal Axis (HPA Axis) functioning, just to reference a few.
- The full-body impact of toxic stress becomes more evident considering the role of cortisol ("stress hormone"). Overtime chronic, persistent stress prompts over-activation and sustained engagement of the HPA-Axis, continuing cortisol release which prohibits the body from restoring homeostasis. The effects of continued exposure to cortisol lead to inflammation and comorbidities, which lead to increased mortality.

Therefore, preventing or addressing stress is very important- especially in early childhood. Any and all interventions and treatment programs that strive to lower stress will also buffer negative physiological outcomes that lead to poor life outcomes and even early death.

Research has further demonstrated the impact of positive experiences on child development as well. Many studies have shown:

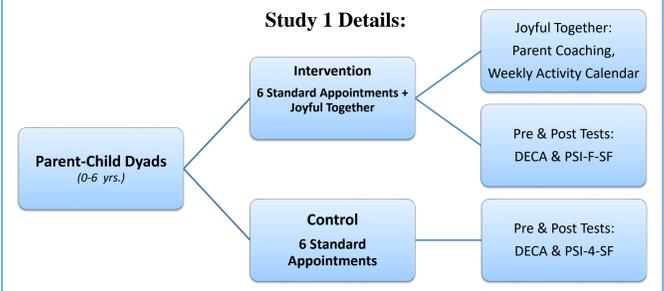
- We can buffer the impact of stress by co-regulating with children to regulate their stress response system; limiting persistent engagement.
- Increased resiliency (protective factors) allows for improved capacities to handle current and future stressors by building skills that eventually provide top-down input to the stress response system.
- Improvement in cortisol levels might suggest more efficient and healthy operation of the HPA Axis.
- At least 1 supportive, caring adult can decrease various lifelong negative impacts of childhood adversity, stress and trauma.
- CARE (relationships) and PLAY (interpersonal learning, joy) help build resiliency.
- Stress impacts parents' relationships with their children, but when stress is managed or decreased parents can have improved interactions with their children.

Objectives
Considering this, we postulated that Joyful Together®:

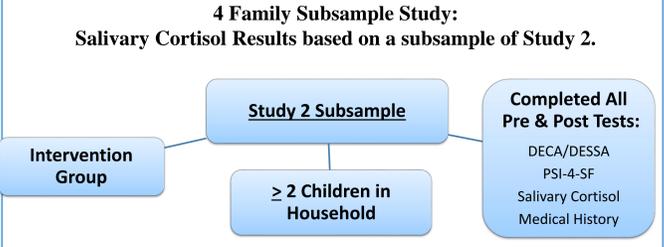
- Improves Relationships:**
 - Parent-child play with activities would improve relationships by lowering parent stress;
 - Non-client children would be impacted by Joyful Together®;
- Increases Resiliency:**
 - Improved relationships would increase childhood protective factors, building resiliency;
- Improves Stress Response System Function:**
 - Decreases in parent stress would be reflected via decreased cortisol release; and correspond to self-reported data from parents.

Methods

- Study 1: Pilot**
- Randomization of Parent-Child Dyads recruited locally from: Help Me Grow, Childcare Center, and Early Childhood Mental Health (Cuyahoga County/Greater Cleveland, Ohio)
 - Study Sessions embedded in Standard Appointments (Childcare Center participants did in-home 'play sessions')
 - Trained Early Interventionists Recruited, Enrolled, Conducted Study Play Sessions & Collected Data



- Study 2: Family Expansion with Salivary Cortisol Phase**
Study 2 expanded the Pilot Study with key changes:
- Increase Age Range: 0-12 year olds (& DESSA for 6-12 year olds)
 - Families: Current Clients, Child of Caregiver Client, Household Child Relative of Client
 - Salivary Cortisol Collection & Analysis



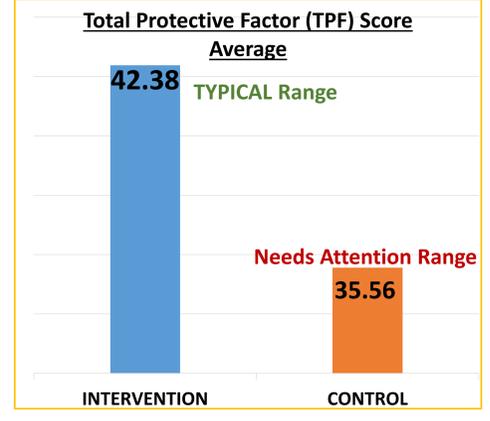
- Salivary Cortisol Collection**
- Written and Picture Instructions Provided with Sample Kit
 - Pre: after Visit 1/day of Visit 2 | Post: day of Visit 6 (final)
 - Within 30 minutes of awakening (no later 10am)
 - No: Foods, Drinks, Nursing, Brushing, Smoking, Etc. before collection
 - Store in Freezer until Transported to Study Site/Research Lab

- Salivary Cortisol Sample Kit**
- Salivette Collection Tube; SalivaBio Oral Swab SOS (6-12 years & Parents) and Children's Swab SCS (0-5 years)*
 - Instructions, Gloves, Biohazard Storage Bag, Labels
 - Medical History Form: current medications & diagnoses, recent drinks and meals, smoking habits for Parent & Child
- *Manufacturer: Salmetrics

Salivary Cortisol Sample Analysis
Storage, Preparation & Analysis conducted by the Dahm's Clinical Research Unit at University Hospitals Cleveland Medical Center using the Salmetrics Cortisol ELISA Kit (saliva) Assay (1-3002).
(Made possible by: University Hospitals Cleveland Medical Center (UHMC) & Clinical and Translational Science Collaborative of Cleveland, 4UL1TR000439)

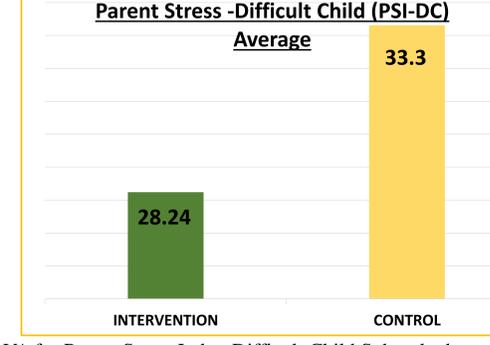
Results

INCREASED CHILDHOOD RESILIENCY
Significant Improvement: Intervention Total Protective Factor Scores



ANCOVA for 3-5 year old DECA Total Protective Factors Post Scores demonstrated a significant improvement for children receiving Joyful Together® intervention. (Intervention n=8; Control n=9, p=0.024)

LOWERED PARENT STRESS
Significant Improvement: Intervention Difficult Child Parent Stress



ANCOVA for Parent Stress Index-Difficult Child Subscale demonstrated a significant decrease in parent stress for families receiving Joyful Together® intervention. (Intervention n=31; Control n=19, p=0.033)

LOWERED SALIVARY CORTISOL
Lowered: 3 of 4 Parents Salivary Cortisol & 4 Parents Overall Total Stress
Each 4 Families' Salivary Cortisol and Stress was further review:

FAMILY A	Mom (38yrs)	A-224 (5yrs)	A-309 (7yrs)	A-323 (8yrs)
Salivary Cortisol	LOWERED	LOWERED	LOWERED	LOWERED
Total Parent Stress per Child	-	INCREASED	LOWERED	LOWERED
Medical History	Asthma (inhaler), ADD (Strattera), Sleep Apnea, Low VitD, Hypothyroidism (Levothyroxine), Allergies	NONE	Asthma (inhaler), Heart Murmur	ADHD, Anxiety
Salivary Cortisol		LOWERED	INCREASED	LOWERED
Total Parent Stress per Child		SAME (LOW)	LOWERED (113% LOWER)	LOWERED
Medical History		NONE	Anxiety	NONE
Overall Average Stress: LOWERED (Approx. 40 th Percentile)				

Results (continued)

FAMILY B	Mom (37yrs)	B-6180 (11yrs)	B-6201 (7yrs)
Salivary Cortisol	LOWERED	LOWERED	LOWERED
Total Parent Stress per Child	-	LOWERED	LOWERED
Medical History	PTSD, Hypertension, Allergies	NONE	Intellectual Delays
Overall Average Stress: LOWERED (Still Relatively High- approx. 74 th Percentile)			

FAMILY C	Mom (32yrs)	C-303 (8yrs)	C-446 (12yrs)	C-715 (5yrs)
Salivary Cortisol	INCREASED	INCREASED	LOWERED	INCREASED
Total Parent Stress per Child	-	INCREASED	LOWERED	INCREASED
Medical History	Anxiety, Allergies, Mirena (progesterone)	ADHD, Allergies, Melatonin	Asthma (Inhaler), ADHD (unmed.), Allergies	Asthma, Autism, G-Tub, Eustachian Tubes, Allergies
Overall Average Stress: LOWERED (Still Relatively High- approx. 74 th Percentile)				

FAMILY D	Mom (28yrs)	D-628 (3yrs; Twin)	D-707 (3yrs; Twin)
Salivary Cortisol	LOWERED	INCREASED	LOWERED
Total Parent Stress per Child	-	INCREASED	LOWERED
Medical History	Anxiety/Depression (Zoloft), PTSD, Gestational Diabetes	Asthma (inhaler)	NONE
Overall Average Stress: LOWERED (Approx. 40 th Percentile)			

Conclusions & Opportunities

- Joyful Together® (a parent-child play based model):
- Improves Relationships (Difficult Child Parent Stress Reduced)
 - Builds Childhood Resiliency (Increased Total Protective Factors)
 - Lowers Parent Stress (Difficult Child & Overall Average Parent Stress Reduced)
 - Impacts Parent Relationship with Siblings/Household Family, even if not receiving clinical services (Overall Average Parent Stress Reduced)
- Based on findings, thus far, can conclude that play-based activities dampens effects of toxic stress by improving relationships and building resiliency.

- Still opportunities exist:
- Capture more data with larger sample size
 - Consider longitudinal study of impact on relationships and parent stress
 - Measure effects across age groups to examine if model more effective for particular age/stage
 - Examine potential as preventative model to buffer toxic stress' long-term effects

- Salivary Cortisol & Self-Reported Parent Stress:**
- Correlation between Decreased Cortisol and Self-Reported Parent Stress in all but 1 family
 - Further examination needed to elucidate connections between child and/or parent health histories, prescriptions with salivary cortisol, stress and protective factors
 - Consider examining Joyful Together's impact on diurnal cortisol pattern for parents and children
 - Examine demographic, social, economic, educational & political correlations and variances in data/future sample
 - Explore potential causes of cortisol outliers (e.g. in Family C&D)

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