FAMILIES MOVING TOGETHER: INCREASING PHYSICAL ACTIVITY BY TARGETING PARENTS EXCLUSIVELY VS. PARENTS TOGETHER WITH CHILDREN

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INTRODUCTION

Background to the Problems

- The majority of Americans do not engage in the recommended amount of physical activity (CDC, 2007; 2008).
- Physical activity declines in adolescence (CDC, 2010).
- Physical activity behaviors in adulthood are commonly established during childhood and adolescence (Friedman et al., 2008; Tammelin et al., 2003; Telama et al., 2005).
- Interventions involving the family have great potential for changing children's exercise behaviors, but more research is needed (O'Connor et al., 2009; van Sluijs et al., 2007; Ward et al., 2007).

Purposes of the Current Study

1) Use the conceptual framework of social cognitive theory and family reciprocal determinism to implement and evaluate the use of a family educational intervention to increase physical activity in all members of the family,

2) Determine which treatment is better for increasing the levels of physical activity, the parent-only treatment group, or the parents-children treatment group, and

3) Determine which treatment is more effective for improving exercise self-efficacy in all family members, the parent-only treatment group, or the parents-children treatment group.

LITERATURE REVIEW & HYPOTHESES

Theory tells us:

- Behaviors are a dynamic of the individual and the environment, therefore, environmental interventions are an avenue for the development of healthy behaviors (Baranowski, Perry, & Parcel, 2002).
- Family reciprocal determinism: The model suggests that family member behaviors, skills, knowledge, and attitudes interact to create an emergent family environment related to health behaviors (Baranowski, 1997).

Literature Gaps

- The majority of family studies are focused on pediatric obesity, weight loss, and nutritional behaviors.
- There was a lack of focus and alignment with theoretical models in previous family-based studies.
- There was mixed evidence on the overall success of targeting families to promote physical activity.
- Few interventions have assessed changes in self-efficacy as a result of a family-based intervention.

Research Questions

- Can an education intervention targeting only the parents successfully increase the levels of physical activity for all participants?
- Can an education intervention aimed at both parents and children successfully increase the levels of physical activity for all participants?
- Are there significant differences in changes of physical activity levels between those participating in the parents-only treatment group versus the parents-children treatment group?

Research Questions

- Can an education intervention targeting only parents successfully improve exercise self-efficacy for all participants?
- Can an education intervention aimed at parents and children successfully improve exercise self-efficacy for all participants?
- Are there significant differences in changes of exercise self-efficacy between those participating in the parents-only treatment group versus the parents-children treatment group?

Research Hypotheses

- Physical activity levels assessed by objective and subjective measures will be significantly and positively associated with parent-only involvement in the educational intervention.
- Physical activity levels assessed by objective and subjective measures will be significantly and positively associated with parent-child involvement in the educational intervention.
- The parent-only treatment group will have a greater effect on physical activity levels assessed by objective and subjective measures.

Research Hypotheses

- Participants in the parent-only treatment group will have positive changes in exercise self-efficacy.
- Participants in the parent-child treatment group will have positive changes in exercise self-efficacy.
- The parent-only treatment group will have a greater effect on exercise self-efficacy assessed by questionnaires.

METHOD

Participants

- 75 families signed up and committed to participate, only 24 attended the first meeting and participated in baseline assessments.
- The baseline sample size included 64 participants: 38 children and 26 parents.
- Convenience sampling was used to assign families to a treatment group, either the parents-only group (POG, n=29) or the parents-children group (PCG, n=35).

Instrumentation

- Demographic Questionnaires
- Pre and Post Self-Efficacy Instrument (McAuley, 1992 ; Motl, et al., 2001)
- Pre and Post Self-report Activity Questionnaires (IPAQ, n.d. ; Westin, Petosa, & Pate, 1997)
- Digi-walker power walker by Yamax ©
- Body weight
- "Parent Program Participant Feedback Form"

Intervention Design & Agenda

Week	Procedures
Week 1	Introduction to the Program Baseline Measurements Pedometers Issued to Participants
Week 2	1st Session: Energize our families- Getting Started Activity Journal Distribution and Discussion Activity: Yoga with Kids
Week 3	No Sessions
Week 4	2nd Session: Find Fun in Physical Activity-Energy Out Distribution & Explanation of 1st Activity Calendar Activity: Chair Exercises
Week 5	No Sessions
Week 6	No Sessions
Week 7	3rd Session: Less Sit, More Fit-Decrease Screen Time and Increase Energy Out Distribution & Explanation of 2nd Activity Calendar Activity: "The Dice Game"
Week 8	No Sessions
Week 9	4th Session: Maintain a Healthy Weight for Life Distribution & Explanation of 3rd Activity Calendar Activity: "Family Activity Bingo"
Week 10	Participants picked up the Pedometers
Week 11	Post Test Measurements Return Pedometers Exit Survey Celebration

Lesson Number	Lesson Objectives/Elements	SCT Constructs
Lesson 1	Describe the important role that family plays in learning new behaviors.	RD, F, CE
	Define and give examples of ways to support behavior change.	SE, F
Lesson 2	List 3 reasons that being physically active is fun.	OE
	Identify 3 ways of adding physical activity into family's daily lives.	SE, F, RD
	List 3 ways to overcome challenges to getting more physical activity.	RD, SE, F
	Identify the amount of time that adults and children should be physically active.	F
Lesson 3	Assess the amount of time family members spend in front of screens.	F, SR
	List 3 ways the family can limit screen time to no more than 2 hours per day.	SR, SE, F
	List 3 physically active things they can do instead of screen time.	SE, F
Lesson 4	List ways to handle setbacks and stay motivated to maintain a physically active lifestyle.	SE, F, SR
	Identify 3 resources to go to for more information about maintaining a physically active lifestyle.	F, SR

Key:

RD= Reciprocal Determinism, F= Facilitation, OE= Outcome Expectations, SE= Self-Efficacy, CE= Collective Efficacy, SR= Self-Regulation

Methods of Data Analysis

- **Descriptive Statistics**
  - **Mean, standard deviation, and frequency**
- **Pearson's Correlation**
  - **Self-report physical activity data and the objective pedometer data**
  - **Self-report physical activity and attendance.**
  - **Objective pedometer data and attendance.**
- **Paired-samples t-tests**
  - **Performed to assess changes from pre- to post-testing for all participants: self-reported physical activity , pedometer readings, body weight, and exercise self-efficacy.**
- **Independent-samples t-tests**
  - **Treatment group and role (parent or child) differences in change from pre- to post-testing: self-reported physical activity , pedometer readings, body weight, and exercise self-efficacy.**

RESULTS

Participant Demographics-Completers

		Total (n = 40)	Parents (n= 16)	Children (n=24)
Mean Age (SD)		22.6 (14.8)	38.69 (7.8)	10.9 (3.8)
Treatment Group (#)				
	POG	20	8	12
	PCG	20	8	12
Gender (#)				
	Male	7	0	7
	Female	33	16	17
Ethnicity (#)				
	White-non-Hispanic	14	6	8
	African-American	0	0	0
	Hispanic	24	10	14
	White-Hispanic	2	0	2

Results- demographics

- 100% of the parents completing the study were women.
- 62% Retention Rate (24 non-completers)
- 60% of participants were Hispanic
- 57% had a BMI > 26.9 $mg \cdot kg^{-2}$ at baseline
- 69% were married or living with a partner
- 94% had a high school diploma or GED
- Attendance:
  - 17% attended all 4 sessions
  - 25% attended 3 sessions
  - 58% attended 2 or fewer sessions

Paired t-tests: Physical Activity

Table 6

Paired t-test of Physical Activity

Variable	Pre-test Mean ±SD	Post test Mean ±SD	*t*	*df*	*p*	*r*
Pedometer Steps	5970.10 3451.24	4529.76 1982.88	2.10	21	.048**	.40
Child Self-report (MVPA/day)*	7.01+ 4.35	7.31+5.70	-.22	13	.826	.10
Adult Self-report (METS·min·wk^{-1})	867.88+1027.97	1108.70+1113.86	-1.04	12	.317	.30

* *MVPA, moderate to vigorous physical activity ; average number of 30 minute blocks with activity of ≥ 3 METS*

***p*<0.05

Paired t-tests: Children's Physical Activity

Table 7
Paired t-test of Physical Activity for Children

Variable	Pre-test Mean ±SD	Post test Mean ±SD	*t*	*df*	*p*	*r*
Self-report PA (MVPA/ day)*						
POG (n= 8)	8.63±1.72	8.56 ±2.52	.028	7	.979	.01
PCG (n=6)	4.86 ±2.52	5.64±1.13	-.696	5	.518	.30
Pedometer Steps						
POG (n=6)	6650.92 5051.50	3764.95 2401.55	-2.33	5	.067	.91
PCG (n=4)	4306.83 1445.24	3257.05 1287.13	-1.10	3	.350	.04

** MVPA, moderate to vigorous physical activity ; average number of 30 minute blocks with activity of ≥ 3 METS*

Paired t-tests: Adult's Physical Activity

Table 8

Paired t-test of Physical Activity for Adults

Variable	Pre-test Mean ±SD	Post test Mean ±SD	*t*	*df*	*p*	*r*
Self-report PA (METS·min·wk^{-1})						
POG (n= 7)	764.26 ±905.15	1232.25 ±1382.24	-1.27	6	.253	.54
PCG (n=6)	988.77 ±1233.04	964.57 ±799.14	.10	5	.925	.04
Pedometer Steps						
POG (n= 8)	7479.04 2664.23	5181.89 1696.31	-1.91	7	.097	-.17
PCG (n=35)	3594.29±1995.91	5645.44±1848.30	1.98	3	.142	.42

Paired t-tests: Body Weight

Table 9

Paired t-test for Weight Change

Variable	Pre-test Mean ±SD	Post test Mean ±SD	*t*	*df*	*p*	*r*
Children (n= 19)	101.37±45.43	104.42±44.73	-4.15	18	.001*	1.07
POG (n= 10)	97.50 ± 42.80	101.00 ± 41.66	-3.10	9	.013*	.91
PCG (n=9)	105.67 ±50.43	108.22 ± 50.17	-2.67	8	.029*	.63
Adults (n= 14)	198.57±51.27	198.43±50.49	.118	13	.908	.13
POG (n= 7)	203.00 ± 57.41	204.29 ± 54.55	-0.84	6	.431	.40
PCG (n= 7)	194.14 ±48.52	192.57 ±49.67	0.86	6	.425	.20

*$p<0.05$

Paired t-tests: Exercise Self-efficacy

Table 10

Paired t-test for Self-efficacy

Variable	Pre-test Mean ±SD	Post test Mean ±SD	*t*	*df*	*p*	*r*
Child Self-efficacy						
POG (n= 10)	1.69 ±.222	1.54 ±.323	-1.08	9	.305	.35
PCG (n=10)	1.63 ±.333	1.51±.405	-2.21	9	.054	.83
Adult Self-efficacy						
POG (n= 8)	38.75 ±11.71	44.52 ±16.23	-1.09	7	.308	.42
PCG (n=10)	52.23 ±18.90	54.69 ±19.25	-.514	9	.620	.20

Program Evaluation Responses

	Agree (3)	Strongly Agree (4)
The program was very useful to me as a parent	46.2	53.8
I learned how to help my family maintain a healthy weight.	69.2	30.8
I got useful tips to help my family be more physically active.	30.8	69.2
The program taught me how to reduce screen time.	58.3	41.7
I learned how much physical activity my family needs.	30.8	69.2
I want to share what I learned with other parents	53.8	46.2
I would recommend the program to a friend.	15.4	84.6

* Nobody marked “disagree” or “strongly disagree”

DISCUSSION

Discussion

- We were only able to look at the effects of the study on women and children.
- Self-report data and pedometer data was not correlated. (Ransdell et al., 2004)
- The intervention did not result in significant improvements in physical activity for either treatment group.
  - Small, but significant difference between the two treatment groups for the adults.

Discussion

- Children in the study gained weight from pre- to post testing (Ransdell et al., 2001).
- Adults in the study maintained their weight from pre- to post testing (Sherry et al., 2010).
- The intervention did not result in significant improvements in exercise self-efficacy for either treatment group (Harrison et al., 2006).

Limitations

- Convenience study, no randomization due to a low response.
- Low retention rate.
- Small sample size, not generalizable.
- No control group

Lessons Learned

- Integrate the program within the structure of a host organization.
  - Multi-level approach (Marcus et al., 2006; van Sluijs et al., 2007)
- Recruitment of father's (Waters et al., 2011):
  - Tailor programs specifically for men (Morgan et al., 2011).
  - Use humor and/or comical language in recruitment materials (Morgan, Warren et al., 2011).
- Use means to increase attendance.

Lessons Learned

- Possible factors influencing physical activity:
  - Non-participants may sabotage dedication or enthusiasm (Stanforth & Mackert, 2009).
    - Identify negative influences
    - Preventive strategies to overcome this barrier
  - Seasonal Timing (Tovar et al., 2010)
    - Consider seasonal timing in planning
    - Discuss structured summer activity
  - Accurate measures to assess physical activity
    - Select more accurate instrumentation
    - Require an activity diary
    - Prizes and awards tied to program objectives and compliance

Lessons Learned

- May need to combine strategies for dietary change with physical activity modifications to increase weight loss (Mozaffarian et al., 2011).
- Increase the opportunities for vicarious learning experiences and feedback (Ashford et al., 2010).
- The effectiveness of the curriculum is not known, therefore further studies should be conducted.

Future Directions

- The participants found the program useful and would recommend it to a friend.
- A family-based intervention may be effective for promoting increases in physical activity and weight maintenance in participating adults.
- The increasing prevalence of problems related to low physical activity levels, including obesity and related diseases, suggest the continued need for research in this area.

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