Homeschooling Parent Stress Levels and Its Association with the Mental and Physical Health of Their Children

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Abstract: Stress has become a common symptom linked to several illnesses including cancer, diabetes, cardiovascular disease, asthma, and rheumatoid arthritis. Recent research has drawn evidence to show parents who experience stress are often or always tend to be overweight and also have overweight or obese children contributing to the global burden of disease. The majority of stress research focuses on public school children and their parents due to easy access to the population. Less is known about the highly understudied homeschool population and the unique parent and teacher relationship. The purpose of this study was to determine if the stress levels of homeschooling parents have an effect on the mental and physical health of their children. Homeschool children (n=20) and their parents (n=13) completed the Perceived Stress Scale (PSS-10) to determine self-reported stress levels. The child participants also completed fitness testing to determine physical health. It was found that overall stress levels of homeschooling families are relatively low when compared to national averages. It was also determined that a positive relationship was found between the parents and their children's stress levels. No relationships were found between physical fitness levels and stress levels in either sample. The unique structure of the homeschool environment might contribute to lower levels of stress in both parents and children.

Keywords: Stress, Family Health, Homeschooling

Stress and Health

It has been well established that there is a direct relationship between parental influence and the overall health of their children (Hohepa et al. 2009). This connection could potentially be a contributing factor to the increasing prevalence of metabolic syndrome and obesity in youth (Zimmet et al. 2007). It is estimated that approximately 17 percent (12.7 millions) of US children and more than one-third (34.9 percent or 78.6 millions) of US adults are overweight or obese (Ogden et al. 2014). In order to combat this growing epidemic, the Centers for Disease Control and Prevention (CDC) recommends that youth receive at least sixty minutes of moderate to vigorous aerobic activity per day and adults receive at least 150 minutes per week of moderate activity to reduce the risk of developing obesity and other risk factors for diseases like type 2 diabetes and heart disease (US Department of Health and Human Services 2008a). Unfortunately, 80 percent of US children, adolescents, and adult counterparts do not meet the recommended guidelines (USHHS 2014); making it critical to determine potential causes and influential variables contributing to this national health burden.

Stress has become a common symptom as a result of the fast-paced twenty-first-century lifestyle and has also been linked to several illnesses including cancer, diabetes, cardiovascular disease, asthma, and rheumatoid arthritis (Cohen, Janicki-Deverts, and Miller 2007; Boll, Perry, and Rozensky 2002; WHO 2010). Stress is associated with decreased physical function over time (Cheng and Coakley 2000), and obesity (Holmes, Ekkekakis, and Eisenmann 2010; Ogden and Stroebele 2012; Siervo, Wells, and Cizza 2009); increasing the risk of cardiovascular disease and other chronic health conditions. It has also been shown to impair lifestyle choices such as exercise, physical activity, and increased sedentary behavior (Hamer 2012).

The American Psychological Association (APA) performs a national study which aims to examine the stress levels of adults in the United States. The most recent survey, *Stress in America Paying with Our Health* (2015), concluded that Americans are stressed mostly regarding

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America Paying with Our Health (2015), concluded that Americans are stressed mostly regarding financial pressures, followed by work, family responsibilities, and health concerns. Though US adult stress ratings have dropped from 6.2 to 4.9 on a 10-point scale (where 1 is "little or no stress" and 10 is "a great deal of stress"), the adverse health effects are continuing to plague the nation. Physical and mental health problems are most frequent among women, adolescents, young adults, black people, and Hispanics, persons who are single, and lower socioeconomic status individuals (Thoits 2010). *The Stress in America Findings* (2010) states obese adults and children are likely to experience higher levels of stress. It was found that overweight children report being able to tell when their parents are experiencing stress during the past month. It also suggests Americans who are struggling to balance stress in their lives are not only adversely affecting their personal physical health, but taking a toll on the physical well-being of their families; especially their children.

Family Stress

This residual effect of stress can result in "parenting" or "parental" stress which is defined as stress felt in response to the demands of being a parent and can not only be attributed to raising a child, but other social and environmental circumstances, responsibilities, and everyday life (Cronin et al. 2015).

Health status is an early life attainment and research has consistently concluded that families of certain risky characteristics lay the groundwork for long-term damaging physical and mental health problems in their children (Repetti, Taylor, and Seeman 2002). Similar to adults, children and adolescents raised in stressful environments tend to be at risk for certain health-threatening behaviors such as drug abuse, sexual promiscuity (Repetti, Taylor, and Seeman 2002), lack of sleep, lack of exercise, and poor dieting habits (APA 2014).

As early as 1904, Stanley Hall distinguished adolescence as a period of "storm and stress." It has also been identified as a "unique period of the life cycle" (KS and Reddy 2006, 5–6) in which the brain displays remarkable changes in both structure and function (Romeo and McCewen 2006). However, it is also a significant period for certain developmental vulnerabilities (Anderson 2003; Spear 2000) such as increased levels of stress resulting in poor health (Romeo and McCewen 2006). While this research is compelling, it is heavily focused on the general public and does not consider sub-categories such as the homeschool population; a growing demographic in the United States in which little research is focused (Green and Hoover-Dempsey 2007).

Literature related to the homeschooling environment is limited (Barwegen et al. 2004), even though the number of families choosing home-bound instruction has seen a steady increase over the past several decades. In Homeschool education, the parent provides the majority of their child's academic instruction based out of the home without sending their child to a place called school (Ray 2011). It is believed that there currently are over two million children being educated in the home, up about 3 percent from 2007 (Ray 2011). This equates to approximately 2 percent of the entire school-age population in the United States with 3.5 percent being five to seventeen year olds and 53 percent being middle- or high-school-aged (Kunzman and Gaither 2013; Noel et al. 2013). With increasing popularity of home school education, it is crucial to begin examining the impact of this environment on the health of children (Wachob 2015).

Since there is a direct connection between parental influence and children's health (Hohepa et al. 2009) and the environment of the child plays such a crucial role in their health status (Wachob 2015); it is imperative to begin further examining this relationship in theses sub-populations as well. Therefore, the purpose of this study is to determine if the level of perceived stress experienced by homeschooling parents is associated with their children's levels of both physical (physical fitness) and/or mental (perceived stress) health.

Method

This study examined the association between the perceived stress levels of homeschooling parents and their children mental and physical health status. This study also compared homeschooling parent and children demographic characteristics with their mental and physical health status. All tables and data were created by the author(s).

Participants

This study consisted of a cohort of families enrolled in a university-based physical education program in western Pennsylvania. Table 1 displays a demographic description of the parent participants involved in the study (n=13). Of the thirteen parent participants, the mean age was 41.62 with a standard deviation of 6.27. Four (30.7 percent) mothers were between the ages of 30-36, three (23.1 percent) between 37-42, five (38.5 percent) between 43-49 and one (7.7 percent) 50 or above. The sample consisted entirely of females (100 percent) whom were also mothers of the children enrolled in the education program. The average number of children per participating homeschool family is 3.31 with a standard deviation of 1.79 of the mothers, two (15.4 percent) had one child, one (7.7 percent) had two children, six (46.2 percent) had three children, two (15.4 percent) had four children, one (7.7 percent) had five children and one (7.7 percent) had eight children. Twelve out of the thirteen mothers (92.3 percent) were married, with only one indicating being single. All of the mothers had at least a high school diploma with many reporting post-secondary education, including as a bachelor's degree (n=7) (53.8 percent) or graduate degree (n=3) (23.1 percent). Their employment status is also described and most of the mothers identified themselves as stay-at-home parents (n=11) (84.6 percent), a few identified part-time work employment (n=2) (15.4 percent) and none were identified as having full-time employment status.

Table 1: Demographic Information of Parents

		Frequency	Percentage
Age	30–36	4	30.7
	37–42	3	23.1
	43–49	5	38.5
	50>	1	7.7
Gender	Male	0	0.00
	Female	13	100.00
Number of Children	1	2	15.4
	2–3	7	53.8
	4–5	3	23.1
	>5	1	7.7
Marital Status	Single	1	7.7
	Married	12	92.3
Education Level	No High School	0	0.00
	High School Diploma	3	23.1
	Bachelor's Degree	7	53.8
	Current Graduate	0	0.00
	Graduate Degree	3	23.1
Employment Status	Stay-at-Home Parent	11	84.6
	Part-Time Employed	2	15.4
	Full-Time Employed	0	0.00

Table 2 is a demographic description of the children participants of the study sample (n=19). Of the nineteen participating children, the mean age was 12.37 with a standard deviation of 2.49. Five (26.3 percent) children were between the ages of nine and ten, seven (36.8 percent) between eleven and twelve, two (10.5 percent) between thirteen and fourteen, and five (26.3 percent) between fifteen and sixteen. The sample consisted of eleven females (57.9 percent) and eight males (42.1 percent).

Table 2: Demographic Information of Children

		Frequency	*Percentage*
Age	9–10	5	26.3
	11–12	7	36.8
	13–14	2	10.5
	15–16	5	26.3
Gender	Male	8	42.1
	Female	11	57.9

Data Collection Procedures

Parents were administered a version of the Perceived Stress Scale (PSS-10) regarding their perceived stress levels and also asked to identify other relevant sociodemographic information (i.e., age, gender, marital status, education level, and employment status). Children completed an identical PSS-10 survey separately from their parents and were also asked to indicate their age and gender. Specifically, parent survey results were compared to their own children's survey results and child fitness testing scores. In addition, children's survey results were compared to their own fitness scores.

Perceived Stress Scale (PSS-10)

The *Perceived Stress Scale (PSS-10)* is the most widely used psychological instrument for measuring the perception of stress (Cohen 1983). It is a measure of the degree to which situations in one's life are appraised as stressful. A 10-item questionnaire with five Likert scale ratings (0=Never and 4=Very often) are designed to determine how much unpredictability, uncontrolledness, and overload respondents find in their lives. The scale also includes direct queries about current levels of experienced stress. The *PSS-10* was designed for use in community samples with at least a junior high school education (Cohen 1988). Items ask respondents about thoughts and feelings within the last month and how often they felt a certain way (Cohen 1988).

Cronbach's Alpha is a measure of internal consistency reliability, with a value >.70 considered a minimum measure of internal consistency. In twelve out of twelve studies which used the PSS-10, Crobach's Alpha was evaluated at >.70; establishing rigid reliability (Lee, 2012). Test-retest reliability was also measured using a correlation coefficient such as Pearson's and Spearman's. In four studies, the PSS-10 met the criterion of >.70 in all studies (Lee 2012). The PSS scores of validity were lower for groups of participants who were young, white, married, employed, earning a higher income, and parents with a smaller number of children (Lee 2012). However, Terzian et al. (2010) determined that the PSS-10 is a "well-validated" instrument to measure stress among adolescents.

The fitness scores were collected on the children using the FITNESSGRAM assessment (Cooper Institute 2010). This instrument is a comprehensive tool used to assess aerobic capacity, body composition, muscle strength, muscular endurance, and flexibility of an individual. The FITNESSGRAM uses criterion-referenced health standards which define Healthy Fitness Zones (HFZ) for which a participant compares his/her score. Specifically, the test measures included the PACER test, curl-up test, 90° push-up test, and the Back-Saver Sit and Reach Test.

PACER Test

The *PACER* (Progressive Aerobic Cardiovascular Endurance Run) is a measure of participant's aerobic capacity. This test requires participants to run a series of 20-meter laps to a timed cadence with the speed increasing each minute until the child cannot complete the lap in the designated time. The calculations of aerobic capacity include a formula that uses the PACER results with participants' heights and weights. The PACER has been administered to millions of students and is the most endorsed fitness test by school districts nationwide (Meredith and Welk 2010).

Curl-Up Test

The curl-up test is a measure of participants' abdominal muscular strength and endurance levels. This test requires students to complete a series of curl-ups (modified sit-up) at a rate of one curl-up every three seconds.

90° Push-Up Test

The push-up test is a measure of participants' upper body muscular strength and endurance levels. This test requires students to complete a series of push-ups at a rate of one push-up every three seconds.

Back-Saver Sit and Reach Test

The back-saver sit-and-reach test is a measure of lower back and hamstring flexibility. Participants are partnered with another student and asked to remove their shoes to complete stretches using a standard sit-and-reach box. With one leg outstretched, foot flat against the side of the box, and the other leg bent so that the foot is flat against the ground. Participants will use both hands to stretch out along the top of the box as far as possible while still being able to the hold the stretch for at least two seconds. Each leg measurement will be taken a total of three times.

Data Analysis

Spearman's Rank (rho) correlation coefficients were used to determine dependence between the two groups (parents and children) and the test variables. Specifically, correlations were analyzed between (1) parental perceived stress levels and reported perceived stress levels of their children, (2) parental perceived stress levels and fitness levels of their children, and (3) reported perceived stress levels of children and their respective fitness scores. All data (parent and children) were grouped by their respective family (intra-family relationships).

In addition, multiple socio-demographic variables were also analyzed for further statistical significance using independent variable t-tests and one-way analysis of variance (ANOVA) to compare means between the demographic groups of both parents and children.

Results

As displayed in Table 3, the mean score on the PSS-10 for parents was 14.46 (SD=5.71) out of the maximum score of 40; indicating relatively low levels of perceived stress. However, a majority (78.9 percent) of parents responded that "sometimes" they have felt nervous and stressed in the past month. Another 21.1 percent rated they had nervous and stressful feelings "fairly often" in the past month. None of the parent participants rated their past month as "never" or "almost never" experiencing nervousness and stressfulness. On the four "positively" stated

items of the PSS-10, 63.2 percent of parents responded with a rating of "very often" indicating they are comfortable and confident in their abilities to handle or control various life responsibilities and stresses. When comparing these results to a 2009 eNation Survey of two thousand adults (Cohen and Janicki-Deverts 2012), the homeschooling mothers in this study had lower perceived stress levels (14.46) than the national average (16.14) on the PSS-10 for women.

Table 3: Perceived Stress Levels of Homeschooling Families

	N	Minimum	Maximum	Mean (SD)
Children	19	0.00	24.00	13.32 (5.49)
Parents	13	6.00	30.00	14.46 (5.71)

Results showed that children followed a similar pattern of their parents with an overall mean score of 13.32 (SD=5.49) out of the maximum score 40; indicating relatively low levels of perceived stress. Survey results indicated that 42.1 percent of children responded that they "almost never" or "never" felt nervous or stressed over the past month. However, another 42.2 percent of children rated their feelings of nervousness and stress as "fairly often" over the past month. Among the four combined positive responses of the PSS-10, the mean score (after reverse coding) was 1.27 equivalent to a "fairly often" rating in level of confidence to handle life responsibilities and stresses.

No current literature established norm scores on the PSS-10 for children to compare to the sample population. However, studies such as the *Stress in America Findings* conducted by the American Psychological Association (2010) indicate that children and adolescents are experiencing increasing levels of stress for a variety of reasons related to both academics, personal and family circumstances. There has also been a notion in previous literature that children's health is directly influenced by their parent's health behaviors (Hohepa et al. 2009). The closely similar mean scores (1.14 difference) between PSS-10 for homeschooling parents and their children indicate this may be evident in this sample population. In addition, the average perceived stress scores also suggest the children are experiencing lower levels of perceived stress similar to that of their parents.

Spearman's rank correlation (rho) results showed that no significant correlation ($r=.20$, $p=.412$) existed between the compared results of the PSS-10 for parents and the PSS-10 for children. Though not significant, this correlation suggests that a positive correlation does exist and as parent perceived stress increases by 1 on the PSS-10, their child's perceived stress increases by 0.20 (alternatively as child's perceived stress increases by 0.20 on the PSS-10, their parent's perceived stress increases by 1).

Table 4 displays descriptive statistics for the FITNESSGRAM data collected on children. The FITNESSGRAM protocols use criterion-referenced health standards which define Healthy Fitness Zones (HFZ) for which a participant's score determines their placement. Participant scores will fall under one criterion for each of the fitness measures. The Push-Up, Curl-Up and Sit-and-Reach only define a Healthy Fitness Zone (HFZ) or Not Healthy Fitness Zone (Not HFZ) status which take into account a participant's age, gender, and score. The BMI defines three criteria of placement as Healthy Fitness Zone, Needs Improvement-Some Risk (NI-Some Risk), or Needs Improvement-High Risk (NI-High Risk). The BMI also takes into account a participant's age, gender, height, and weight. The Child PACER defines two criteria of placement as either Healthy Fitness Zone or Needs Improvement-High Risk; calculated by a participant's age, gender, and number of laps completed. Some children's data are missing from Table 6 due to absence during fitness testing or exclusion by FITNESSGRAM protocols based upon age restriction (FITNESSGRAM does not define criteria for children under ten years of age).

Results from Table 4 show that for the PACER test, eleven (57.9 percent) of the children fell under the HFZ criteria and two (10.5 percent) children fell under NI-High Risk. Push-up scores found that eleven (57.9 percent) children were in the HFZ and four (21.1 percent) children were not in the HFZ. The Curl-Up test had fourteen (73.7 percent) children in the HFZ and one (5.3 percent) child not in the HFZ. The Sit-and-Reach test had eight (42.1 percent) children in the HFZ, and eleven (57.9 percent) children not in the HFZ. Lastly, BMI scores included twelve (63.2 percent) children in the HFZ, three (15.8 percent) children Needs Improvement-Some Risk; and two (10.5 percent) children Needs Improvement -High Risk.

Table 4: Frequencies and Percentages of Children's Fitness Data

		Frequency	Percentage
Child PACER	HFZ	11	57.9
	NI-High Risk	2	10.5
Child Push-Up	HFZ	11	57.9
	Not HFZ	4	21.1
Child Curl-Up	HFZ	14	73.7
	Not HFZ	1	5.3
Child Sit-and-Reach	HFZ	8	42.1
	Not HFZ	11	57.9
Child BMI	HFZ	12	63.2
	NI-Some Risk	3	15.8
	NI-High Risk	2	10.5

As displayed in Table 5, Spearman's rank correlations (rho) results found that a significant correlation exists between Parent's Perceived Stress Level and Child's Sit-and-Reach score. Spearman's rho (-.500) p-value=.029 indicate this significance at the 0.05 level. This indicates a significant negative correlation does exist between the two variables. However, this could be due to the fact this was the only fitness measure which contained the full sample of children (n=19) providing enough power to detect significance. Interestingly, this was also the only fitness measure in which the majority (57.9 percent) of children fell under the Not Healthy Fitness Zone criteria. It was also the only fitness measure in which all child participants (100 percent) completed the measure. The remaining fitness measures including Child's PACER (n=13), Child's Push-Up (n=15), Child's Curl-Up (n=15) and Child's BMI (n=17) all possessed some level of incomplete data from participants and showed no significance when compared to their parent's perceived stress level. However, the Spearman's rho correlation coefficient suggests negative correlations for all fitness measures. Although insignificant, this indicates that as parent's perceived stress increases, physical fitness levels tend to decrease for their child.

Table 5: Association between Parents Perceived Stress and
Their Children's Fitness Levels

	Parent's Perceived Stress Level	
	Spearman's rho	p
Child PACER	-0.174	.570
Child Push-Up	-0.212	.448
Child Curl-Up	-0.282	.308
Child Sit-and-Reach	-0.500*	.029*
Child BMI	-0.189	.467

*Significant at p < 0.05

As displayed in Table 6, Spearman's rank correlation (rho) results showed no significance correlation between children's perceived stress level and any of the five fitness measures including Child PACER, Child's Push-Up, Child's Curl-Up, Child's Sit-and-Reach or Child's BMI. However, although statistically insignificant, the results followed a similar pattern in comparison to parent's perceived stress, indicating negative correlations between the variables. Therefore, it can be suggested that as child's perceived stress levels increase, their fitness levels tend to decrease as well.

Table 6: Association between Perceived Stress Levels of
Homeschooling Children and Their Own Fitness Levels

	Child's Perceived Stress Level	
	Spearman's rho	p
Child PACER	-0.087	.777
Child Push-Up	-0.177	.528
Child Curl-Up	-0.376	.167
Child Sit-and-Reach	-0.108	.660
Child BMI	-0.062	.813

Discussion

This study examined the perceived stress levels of homeschooling parents and children and what level of association exists within these families. By both parents and children answering the PSS-10 survey questions, as well as examining fitness data from the children, a greater sense for these possible associations were determined.

When comparing means for significance in variance between parents' perceived stress levels and the demographic characteristics of parent and child sample populations, no significance can be reported. The same is true when comparing child's perceived stress levels to the demographic characteristics. However, the greatest value was noted when comparing parent's perceived stress levels to their respective education level (F=2.183). According to the World Health Organization, an individual's education level (especially lower), is linked to health and stress.

Overall, the results of this study provided further insight into the homeschool family environment, which is remarkably unique, exceedingly understudied, but rapidly growing in popularity. Although limited statistical significant information can be reported, possibly due to the limitations of a small sample size, several intriguing findings were drawn from this study. While perceived stress levels have been widely examined and reported among a multitude of populations; currently there is no research that exists which has examined the perceived levels of stress experienced by individuals in homeschooling family populations. Determining the average levels of perceived stress experienced by both homeschooling parents and their children are important contributions to the growing literature on the homeschool community as well as the national and global stress concern.

As literature has previously suggested, a number of factors have considerable influence on the health and well-being of children; especially parents. Though the association between parents perceived stress levels and their children's perceived stress levels was found to be statistically insignificant, an existing positive relationship between the two groups was revealed; further indicating possible influence of parental health behavior on their children's health outcomes in the homeschool environment.

It also was determined that a negative relationship exists between the child's fitness levels and both the parent and child perceived stress levels. Literature also reflects that stress is a deterrent of a variety of health outcomes, including physical fitness. Though statistically insignificant, this study was able to determine that a similar relationship exists within the homeschool environment as well.

Homeschool families are increasing tremendously each year and are quickly becoming a substantial demographic in the United States. As health professionals continue to strive for community-wide physical and mental health excellency, it is imperative researchers continue to examine any and all sub-groups of people missing from the data.

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