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An Exploration of Health Behaviors in a Mind-Body Resilience Intervention for Parents of Children with Developmental Disabilities

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Abstract

Objective: Parents of children with special needs such as learning and attentional disabilities (LADs) and autism spectrum disorder (ASD) are at high risk for stress-related disorders. The demands of parenting may compete with time for self-care behaviors such as physical activity, healthy eating, and adequate sleep. The objective was to describe health behaviors among this understudied population and assess the changes after a resilience intervention.

Methods: This was a secondary data analysis of a randomized controlled pilot virtual mind-body resilience intervention (Stress Management and Resiliency Training: A Relaxation Response Resiliency Program) trial for parents of children with LADs (n = 52) and ASD (n = 47). Parents completed self-report questionnaires about their weekly physical activity, eating behaviors, sleep duration, and fatigue before and after the 8-week intervention. Descriptive statistics and pre-post intervention effect sizes (Cohen's *d*) were calculated.

Results: Both parent groups reported suboptimal levels of health behaviors at baseline, but ASD parents reported lower health behaviors than LAD parents. LAD parents improved more on physical activity, with a higher percentage meeting recommendations at postintervention follow-up ($d = 0.71$) than ASD parents ($d = 0.01$). Eating behaviors showed small effect size improvements

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for both groups. Although sleep duration improved only with small or medium effect sizes for both groups, ASD parents rated their fatigue lower after the intervention ($d = 0.81$).

Conclusion: Parents of children with special needs who participated in a virtual resilience intervention demonstrated suboptimal health behaviors. There is a need for targeted interventions for health behaviors that can promote resilience in these high-stress populations.

Keywords

parenting; special needs; physical activity; sleep; fatigue; eating behavior

Many children in the United States are affected by developmental disabilities, including learning and attentional disabilities (LADs—auditory processing disorder, dyscalculia, dysgraphia, dyslexia, non-verbal learning disabilities, visual perceptual/visual motor deficit, dyspraxia, aphasia, and attention deficit/hyperactivity disorder [ADHD]; 35% of public school students) and autism spectrum disorder (ASD; 1.7%).[1–3] Parents of children with LADs or ASD are at higher risk for elevated and chronic stress because of concerns such as their child's functioning, behavior, and social isolation. Both parent groups represent chronic conditions increasingly diagnosed in childhood that may be stigmatized more than physical conditions. Despite similar risk for elevated and chronic stress, parents of children with LADs versus ASD may experience unique challenges related to caregiving and health behaviors, given the differences in condition symptomatology and treatment.[4,5]

Chronic stress can lead to poor health behaviors, such as low diet quality, reduced physical activity, and poor sleep.[6–8] However, little is known about health behaviors in parents of children with special needs, who represent an understudied, high-risk population. A study of caregivers of children with and without ASD did not find any significant differences between the 2 groups in diet quality.[9] Another study of parents of children with and without developmental disabilities, including LADs and ASD, found that parents of children with developmental disabilities had poorer sleep quality, and parental stress was the strongest predictor of poor sleep quality.[10] Furthermore, children with ASD and ADHD commonly have disrupted sleep,[11,12] which also affects parental sleep. Parents of children with ASD may have increased caregiving demands and require additional intervention.[13] Although limited, this research suggests that health behaviors may be negatively affected and related to chronic stress among parents of children with LADs or ASD.

Interventions to improve stress management and increase resiliency (adaptive functioning in the face of stressors) in parents of children with LADs or ASD have the potential to improve health and mental health[16,18] and potentially health behaviors. Previous trials have examined stress management and relaxation techniques to increase resiliency for parents or educators of individuals with LADs or ASD, with mixed results.[14–17] None of these studies have examined changes in health behaviors for parents, nor that there may be differences in stress levels, coping strategies, and interventions tailored for parents of children with LADs versus ASD.

A recent study adapted and tested the Stress Management and Resiliency Training: A Relaxation Response Resiliency Program (SMART-3RP) specifically for parents of children

with LAD[18] or ASD.[16] The SMART-3RP is an empirically supported, manualized mind-body intervention to improve stress management and increase resiliency, incorporating health behaviors (healthy eating, physical activity, and recuperative sleep) as resilience-building activities.[19] The SMART-3RP is feasible, acceptable, and efficacious in diverse populations.[20] The randomized pilot trials of the SMART-3RP intervention among parents of children with LADs or ASD found improvements in resilience, stress levels, coping strategies, distress, and empathy, among others.[16,18]

Stress management and resiliency may be linked to health behaviors, and parents of children with LADs or ASD are especially susceptible to chronic stress and poor health behaviors. Interventions such as the SMART-3RP may improve health behavior in increasing resiliency and improving stress management. Parental stress may be higher or different between the groups studied here, so a stress management intervention may have different utility for the 2 groups. Thus, the effects may not be the same on health behaviors across the 2 groups of parents. This study aimed to determine whether health behaviors were affected similarly, and if there are differences, these should be accounted for in the next phase of this research. This exploratory analysis aimed to (1) characterize parents of children with LADs or ASD in their baseline physical activity, eating, and sleep behaviors; (2) determine whether their heath behaviors changed after participating in the SMART-3RP; and (3) determine the differences in health behavior changes between the 2 parent populations.

METHODS

This secondary data analysis is drawn from 2 randomized controlled pilot trials conducted at an urban academic medical center (ClinicalTrials.gov numbers NCT02772432 and NCT02995408). This study was approved by the Institutional Review Board for this health care system. All parents were at least 18 years old, proficient in English, and able to engage in an online intervention. Of the 53 parents of children with learning and attentional disabilities (LADs) and 51 parents of children with autism spectrum disorder (ASD) who enrolled nationally, 52 LAD and 47 ASD parents provided baseline health behavior data; all child diagnoses were parent-reported. The details of these trials have been previously described.[16,18]

Intervention

The Stress Management and Resiliency Training: A Relaxation Response Resiliency Program is an 8-session multimodal mind-body intervention that targets resiliency and relaxation, aiming to decrease distress and increase growth enhancement.[19] For the larger parent studies, the intervention was adapted separately for virtual delivery and parent group. Parents joined virtual, synchronous groups led by a clinical psychologist for eight 1.5-hour weekly sessions. The sessions focused on eliciting the relaxation response using various mindfulness and meditation techniques[19] and adaptive coping strategies such as problem-solving and creating positive perspectives. The relaxation skills taught were single-pointed focus, breath awareness, body scan, mindful awareness, guided imagery, idealized self, yoga, loving kindness, and mini/ brief mindfulness activities. At the first session, the participants set individualized goals around health behaviors (recuperative sleep, healthy

eating, and physical activity). In the subsequent weeks, they were asked to work toward these goals using self-monitoring, weekly intervention content, and peer problem-solving. Parents in both groups provided qualitative feedback about the group's components in exit interviews.[16,18]

Measures

Health behaviors were measured at the baseline and after the 8-week intervention using self-report questionnaires. Physical activity was measured with a brief physical activity questionnaire based on the International Physical Activity Questionnaire-Short Form.[21] It inquired about the average duration and frequency of weekly leisure time physical activity in the past month spent in light, moderate, and vigorous activities, giving examples of each intensity category. Physical activity categories were created based on calculating duration x frequency for light and moderate-to-vigorous physical activity (MVPA). Meeting physical activity recommendations was defined as ≥ 150 minutes of MVPA per week.[22] Eating behavior was measured using module H from the Cigna Healthy Eating Survey,[23] consisting of 7 items about emotional eating patterns (e.g., "I find food comforting, like being with a familiar friend."). The items were rated from 0 (true) to 4 (not true), and the scores were summed, with higher scores indicating healthier eating patterns. Sleep duration was measured using 4 items from the Pittsburgh Sleep Quality Index,[24] which asks about the hours of sleep each night in the past month. Fatigue was assessed with a fatigue analog scale, which was a Likert scale from 0 (not fatigued at all) to 10 (very fatigued) asking participants to rate their fatigue in the past week.

Analysis

We show mean (SDs) and percentages by group; when the groups are compared, we use *t* tests. Because this study was powered on feasibility and sample sizes are relatively small, the effect sizes (Cohen's *d*) are presented to represent pre-post test changes, rather than *p* values. The effect sizes were considered small (0.2), medium (0.5), and large (0.8+). All analyses were completed in SPSS 24.

RESULTS

Demographics

Parents in both groups were on average in their mid-40s (Table 1). Most parents were female, non-Hispanic/Latino, white, married or living as married, college graduates, and employed. Learning and attentional disability (LAD) parents reported more education than autism spectrum disorder (ASD) parents ($t(100) = 2.28$, $p = 0.025$).

Physical Activity

Light Physical Activity—Pre/post group light physical activity increased with a small effect size for both LAD and ASD parents: from 59.21 (SD: 59.11) to 75.28 (SD: 61.16) minutes per week for LAD parents ($d = 0.27$) and from 63.08 (SD: 91.31) to 78.03 (SD: 75.34) minutes per week for ASD parents ($d = 0.18$). Combined, the effect size (*d*) of the increase was 0.23 (Table 2).

Moderate-to-Vigorous Physical Activity—After the intervention, LAD parents increased their moderate-to-vigorous physical activity (MVPA) from 126.9 (SD: 109.6) to 174.4 (SD: 136.5) minutes per week with a moderate effect size (d = 0.39). Although ASD parents did increase their MVPA on average, from 97.84 (SD: 142.26) to 110.51 (SD: 133.82) minutes per week, the effect size was small (0.09). Combined, there were also small pre-post changes in MVPA (d = 0.20).

Meeting Physical Activity Recommendations—At the baseline, 39.6% of parents of children with LADs and 21.3% of parents of children with ASD met the physical activity recommendation. After the intervention, 61.5% of LAD parents and 21.6% of ASD parents met the recommendation. The effect sizes of the changes were large (d = 0.71) for LAD parents and small (d = 0.01) for ASD parents, and d = 0.30 for both groups combined.

Healthy Eating

The effect sizes for healthy eating behavior were small for both groups. The LAD parents increased their healthy eating score from 14.08 (SD: 4.78) to 15.11 (SD: 4.23) (d = 0.22), and the ASD parents increased from 12.87 (SD: 4.36) to 13.40 (SD: 4.88) (d = 0.11). The combined groups' effect size was also small (d = 0.19) (Table 2).

Sleep and Fatigue

Both parent groups reported increases in average sleep hours, with LAD parents attaining more sleep at both the baseline and the follow-up compared with ASD parents. The increases in average sleep hours per night ranged from 6.54 (SD: 0.95) to 6.91 (SD: 0.82) for the LAD parents (moderate effect size, d = 0.41) and from 6.43 (SD: 0.95) to 6.58 (SD: 1.08) for the ASD parents (small effect size, d = 0.11). The combined groups' effect size was also small (d = 0.22). Despite having fewer hours of sleep and a negligible increase in sleep after the intervention, the ASD parents reported a greater reduction in perceived fatigue after the intervention: 7.49 (SD: 2.03) at the baseline and 5.57 (SD: 2.58) at the follow-up with a large effect size (d = 0.82). The LAD parents reported a smaller yet meaningful reduction in perceived fatigue from 6.03 (SD: 1.98) at the baseline to 5.11 (SD: 1.84) at the follow-up with a moderate effect size (d = 0.48). Combining both parent groups, the pre-post effect size in fatigue improvement was moderate (d = 0.65) (Table 2).

DISCUSSION

Overall, these findings suggest that parents of children with learning and attentional disabilities (LADs) and autism spectrum disorder (ASD) displayed suboptimal levels of self-reported physical activity, healthy eating, and sleep duration. In general, LAD parents demonstrated better health behavior patterns at the baseline and greater postintervention improvements than did ASD parents.

These differences between the LAD and ASD parents' health behaviors may be due to the varying levels of children's caregiving needs, time demands, parental stress levels, and resource utilization with LADs compared with ASD.[25,26] Encouragingly, on average, both parent groups increased their light physical activity and moderate-to-vigorous physical

activity (MVPA) after the intervention, indicating that these populations are amenable to a light-touch health behavior intervention. For both groups of parents, eating behaviors did not show changes. However, although sleep duration (hours) did not increase greatly for either group of parents, fatigue ratings improved, more so in the ASD parents. This present finding suggests that perhaps for this population, sleep duration is not as important as sleep quality or perceived fatigue. Sleep quality may have been improved by reduced stress and increased relaxation from this intervention.[16] This could translate into meaningful gains for parents on a variety of parenting, cognitive, and emotional domains.[27–30] Because children's sleep disruptions affect parental sleep, this is a potential moderator that can be tested in a larger trial to help improve parental health behaviors and stress.

Parents in this study self-reported fewer adherences to health behaviors than nationally representative samples. The aerobic physical activity reported in these samples (39.6% of LAD parents and 21.6% of ASD parents meeting the MVPA recommendations at the baseline) is below the national prevalence of meeting the physical activity recommendations (e.g., 51% self-report meeting the recommended 150 minutes of MVPA per week).[31] However, owing to the structural obstacles to achieving any physical activity in these populations, it is notable that this intervention did show changes. Similarly, the reported sleep duration in both samples was below the recommended 7 hours of sleep per night[32] at both the baseline and the follow-up. These findings suggest that these parents are at higher risk for stress-related conditions and reduced resilience, given their impaired health behaviors, and that parents of children with ASD, in particular, may need additional interventions or resources to achieve recommended healthy behaviors.

This was a small pilot study, of which health behaviors were not a primary focus of the intervention. The changes seen here are likely smaller than what might be expected in a trial focusing on these behaviors. Health behaviors were measured using self-report, which typically overreports physical activity and positive diet behaviors.[33,34] Future studies should collect objectively measured physical activity and sleep data from accelerometers. Although we saw less improvement for ASD parents, this may be related to their high caregiving demands. Given the small sample size, additional variables such as impairment severity, additional children in the household, access to child care, and additional support were not controlled for in the analyses, but moderators such as the degree of impairment should be considered in a larger study. Finally, these samples were largely composed of well-educated, middle-aged white women, which could limit the generalizability to the population at large. Larger and more diverse studies are needed, and future work will continue to use telehealth to disseminate this intervention to harder-to-reach populations.

Previous research has not examined health behaviors among parents of children with LADs and ASD. This analysis demonstrates the need to target interventions for these populations. The goal is to help these parents who experience high daily stress to improve these critical health behaviors to function at the high level that their children's needs demand.

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Table 1.

Sample Demographics at the Baseline by Parent Population (LAD: n = 53, ASD: n = 51)

	N (%) or Mean ± SD	
Variables	**LAD**	**ASD**
Age, yrs	47 ± 5.7	45 ± 7.6
Female	48 (90.6)	49 (96.1)
Hispanic or Latino	2 (3.8)	2 (3.9)
Race		
White	48 (90.6)	43 (84.3)
Black or African-American	2 (3.8)	3 (5.9)
Asian	2 (3.8)	2 (3.9)
Native Hawaiian or other Pacific Islander	0 (0.0)	1 (2.0)
Other	0 (0.0)	2 (3.9)
Marital status		
Married/living as married	48 (90.6)	41 (80.4)
Divorced/separated	2 (3.8)	7 (13.7)
Never married	2 (3.8)	2 (3.9)
Education level		
High school graduate	0 (0.0)	1 (2.0)
Some college/technical school	1 (1.9)	6 (11.8)
College graduate *	51 (96.2)	43 (84.3)
Employment status		
Employed for wages	26 (49.1)	28 (54.9)
Homemaker	13 (24.5)	13 (25.5)
Self-employed	11 (20.8)	5 (9.8)
Unable to work	0 (0.0)	3 (5.9)
Out of work >1 yr	1 (1.9)	1 (2.0)
No. of children in household		
1	17 (32.6)	23 (45.1)
≥2	35 (67.3)	28 (54.9)

ASD, autism spectrum disorder; LAD, learning and attentional disability.

* $p < 0.05$.

Table 2.

Descriptive Statistics and Pre-Post Comparisons of Physical Activity, Healthy Eating, and Sleep Variables by Parent Population (LAD, ASD) and Combined

	LAD (Pre: n = 52, Post: n = 35)					ASD (Pre: n = 47, Post: n = 37)					LAD and ASD combined (Pre: n= 99, Post: n = 72)				
	Pretest		Posttest			Pretest		Posttest			Pretest		Posttest		
Health Behavior	**Mean**	**SD**	**Mean**	**SD**	**Effect Size (*d*)**	**Mean**	**SD**	**Mean**	**SD**	**Effect Size (*d*)**	**Mean**	**SD**	**Mean**	**SD**	**Effect Size (*d*)**
Light physical activity (min/wk)	59.21	59.11	75.28	61.16	0.27	63.08	91.31	78.03	75.34	0.18	60.24	75.53	78.03	75.34	0.23
MVPA (min/wk)	126.98	109.61	174.36	136.50	0.39	97.87	142.26	110.51	133.82	0.09	110.34	125.59	137.13	137.00	0.20
Meeting physical activity recommendations (>150 min MVPA per week)	21	39.6%	24	61.5%	0.71	10	21.3%	8	21.6%	0.01	29	27.9%	30	28.8%	0.30
Cigna Healthy Eating Survey	14.08	4.78	15.11	4.23	0.22	12.87	4.36	13.40	4.88	0.11	13.36	4.73	14.25	4.62	0.19
Pittsburgh Sleep Quality Index duration (hr)	6.54	0.95	6.91	0.82	0.41	6.43	1.55	6.58	1.08	0.11	6.48	1.29	6.74	0.97	0.22
Fatigue analog scale	6.03	1.98	5.11	1.84	0.48	7.49	2.03	5.57	2.58	0.82	6.78	2.16	5.35	2.25	0.65

ASD, autism spectrum disorder; LAD, learning and attentional disability; MVPA, moderate-to-vigorous physical activity

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