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The Role of Early Intervention of Parent-Child Interaction Therapy (PCIT) in Disruptive Behavior Disorders: A Comparison between Hispanic and non-Hispanic Populations in the U.S.A

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Abstract | **Original Research Article**

Purpose: The study was conducted to find the relationship between cultural issues and disruptive behavior disorders of children between Hispanic and non-Hispanic populations in seeking early PCIT treatment and getting better ECBI scores. ***Methods:*** The clinical records of 211 children whose parents had initiated PCIT treatment were reviewed from the Mailman Center of Child Development. SPSS was used to analyze the data and compare the improvement of ECBI scores between the Hispanic and non-Hispanic groups using several sociodemographic variables. ***Results:*** A statistically significant difference was observed in the overall improvement of ECBI scores between early and late PCIT intervention patients. However, there was no significant correlation between the race/ethnicity and early PCIT intervention resulting in improved ECBI scores. ***Conclusions*:** The observed outcomes could offer some insight into future efforts for public health stakeholders in implementing effective health education programs and policies. This will lead to increased awareness of early PCIT intervention and its delivery methods.

Keywords: Public Health, Disease Prevention, disruptive behavior, cultural issues, population.

INTRODUCTION

Mental health disorders among children are significant public health issues due to their prevalence, early onset, and their impact on the child, family and community [1]. Approximately 13%–20% of children living in the United States experience a psychological disorder in their lives [2]. One of the common types of psychological disorders commonly found in children are disruptive behavior disorders (DBD). DBD are common childhood mental disorders, which include attention-deficit hyperactivity disorder (ADHD), oppositional defiant disorder (ODD) and conduct disorder (CD) [1]. The Centers for Disease and Control and Prevention (CDC) reported prevalence rates for these disorders as high as 6.8 % for ADHD, 3.5% for ODD or 3.5 % for CD [1]. The alarming prevalence rates have motivated the public health initiatives and psychologists to work towards the implementation of early interventions and providing optimum healthcare treatments to assist children diagnosed with the above-mentioned disorders.

DBD are also one of the commonest reasons for the referral of children to mental health centers [3, 4]. Studies have shown that DBD might persist or progress, when left untreated [5]. Behavioral parent training (Parent-Child Interaction Therapy (PCIT)) is an effective therapeutic strategy employed in the management of childhood DBD is [6]. PCIT is an evidence-based intervention designed to treat young children with disruptive behavior and improve the parent-child relationship. The program targets children of ages two through seven, and has a two-stage operant model [7]. The first stage is known as the Child Directed Interaction (CDI) stage, which involves training the parents to give positive attention for good behavior and ignore negative behavior [7]. The second stage is known as the Parent Directed Interaction (PDI). Borrego *et al*. stated that "it involves compliance training including, teaching caregivers to provide clear instructions, reward compliance and instructing parents in the use of a time-out technique for noncompliant behavior."

Researchers found successful PCIT interventions in treating children with Oppositional defiant disorder ODD [8]. The PCIT therapy resulted in significant improvements in child behavior and effective parent training strategies [8]. A study by Nixon *et al*. conducted an abbreviated PCIT therapy with five sessions that included telephone contact and videotaped instructions. The positive outcomes from

various reports motivated the psychologists and public health researchers to use PCIT as an early intervention to treat disruptive behavior disorders. Another study conducted by Herschell *et al*. [9] discussed several suggestions for the effective early intervention using PCIT therapy. The study also discussed the importance of exploring the diagnostic, cultural and therapeutic variables in measuring PCIT outcomes. Further, the authors referred to other studies of long-term effectiveness in order to provide stronger evidence for the role of early intervention in prevention of antisocial and problematic behavior in adolescents. However, the study concluded that there was little understanding of families for whom PCIT treatments are less positive. In addition, the authors suggested the need for "translational research to examine the effectiveness of PCIT in real-world clinics and community mental health centers rather than the university supervised research designs that were currently available [9]". Riekert *et al*. found that untreated early child behavior could lead to adverse outcomes including child and family distress, significant aggressive behavior, higher frequency of healthcare use and occurrence of mental health disorders in adulthood. The study suggested that an early PCIT-based intervention was essential so that the children could receive early mental healthcare services before the problems turned severe or chronic [10].

Eyberg Child Behavior Inventory (ECBI) is an excellent and widely used self-report measure of PCIT treatment outcomes [11]. The ECBI is a rating scale that measures disruptive behavior in children ages two through sixteen. The ECBI consists of 36 items measuring typical problem behaviors. Each behavior is rated on two scales: a 7-point Intensity Scale that indicates how often the behaviors currently occur, and a Yes-No Problem Scale that identifies whether the child's behavior is problematic or not [12]. The ECBI Intensity Scale is a sensitive measure to identify changes in children's behavior because the 7-point frequency ratings present the gradual change that takes place in common behavior problems during treatment. Stability of scores was followed by no treatment while the change in scores is followed up with an intervention. A second feature of the ECBI is allowing parents to measure the children's behavior changes that have occurred at any point during the treatment. Thus, it is effective as a measure of treatment outcomes compared to other measures of the children's behavior within the last six months [12]. Many research studies claimed that the ECBI is an excellent tool in PCIT therapy for early identification of children's behavior problems. A study showed that the predictive power of the ECBI exceeded 90% for distinguishing children with diagnosed disruptive behavior disorder from undiagnosed children [13]. nother study found that ECBI was efficient in measuring sub-threshold behavior problems and determining subclinical changes in behavior[14]. This is especially significant within the primary mental health care setting where the substantial goal is early identification of behavior problems before they have reached the level of clinical disorder. ECBI based therapy has strong empirical support in long-term effects. One study showed that ECBI scores were stable over a 10-month period, and suggested that changes on this measure are likely to reflect actual changes in children's behavior [15].

Although the efficacy of early PCIT interventions and the improvement of ECBI scores were well discussed with respect to certain variables such as socioeconomic status, parent's education level, and race/ethnicity, there is still little known about the role of cultural concepts on this intervention. Ethnicity might influence the treatment of disruptive behavior disorders due to the role that cultural concepts, like for example, familism play. Familism is defined, as "a cultural value that emphasizes warm, close, supportive family relationships and that family be prioritized over self". Campos *et al*. also stated that "[familism] has been associated with psychological health [16]". Cultural factors like familism are thought to be relevant in shaping health-related beliefs, attitudes and practices in Hispanic populations and deserve further investigation [17]. Despite the high incidence of psychological disorders in children in the U.S., research showed that Hispanics have fewer of these psychological disorders than non-Hispanics [18]. Given that ethnic differences affect family values and parenting practices, it was possible that being part of the Hispanic culture also might be a factor associated with seeking early PCIT intervention and better ECBI scores[19].

Hence, the present study was designed to address the influence of cultural issues on children's disruptive behavior disorders by investigating if differences existed between the Hispanic and non-Hispanic populations in seeking early PCIT treatment. The authors hypothesized that (a) Hispanic parents would seek earlier PCIT intervention resulting in improved ECBI scores compared to non-Hispanic parents and that (b) Hispanic children will have greater improvement of ECBI scores compared to non-Hispanics with similar parental education levels. In both hypotheses, the independent variable was the cultural concept and familism.

METHODOLOGY

Participants

The clinical records of 211 children whose parents had initiated the PCIT treatment between September 2011 and November 2015 were reviewed. The sample was taken from the Mailman Center of Child Development at the University of Miami Miller School of Medicine. The Mailman Center of Child Development provides free PCIT services including multilanguage CDI and PDI sessions in English and Spanish.

The sociodemographic variables were selected based on child sex, child age, parent's race/ethnicity, parent's level of education, and household income. The study population was representative of diverse race/ethnicity population. The Mailman Center is located in Miami with more Hispanics than other races. However, the center receives cases from all of Florida's health centers that have a large non-Hispanic population.

The criteria for parent enrollment in PCIT treatment in the current project included: 1) children between the ages of two and eight years 2) close and regular communication between parent and child, and 3) completed CDI and PDI treatment sessions.

Measures

The completion status of PCIT measured for inclusion in to the study. The completion of treatment sessions were determined by reviewing the caregiver clinical records for PCIT graduation Further, the investigators used the ECBI Scale as a measure for the outcomes. ECBI is an excellent measure for early identification of children's behavior problems due to high sensitivity for differentiating children with diagnosed disruptive behavior disorder from undiagnosed children [13]. Improvement of ECBI scores was the main outcome in the current project and this was measured, both before and after the PCIT treatment.

Study Design

Pre-test and post-test questionnaires were administered to measure the effectiveness of early PCIT intervention. Early PCIT intervention was determined by taking the mean of age of the child. The formula used represents the first date of starting treatment subtracted from the child's date of birth.

Child age = Intake1Date – Child DOB / (60*60*24*365.25)

Using SPPS 22.0, paired Student t-test was used to compare the ECBI Intensity Scale scores between the pre- and post-treatment situations. Further, independent t-test was used to compare the ECBI scores between Hispanic and non-Hispanic populations. Likewise, the influence of different levels of parent's education was also evaluated.

RESULTS

Of the children enrolled in PCIT treatment, 35.54% were females (n = 75) and 64.45% were males (n = 136), with both having an average age of 4.4 years. The clinic records revealed diversity in the children's race/ ethnicity, with 61% of parents being Hispanic (n = 129) and 39% being non- Hispanic (n = 82). Among the Hispanic Children, 96.9% (n = 125) of the parents were Caucasian, and 3.1% of the parents were from other races (n = 4). Among the non-Hispanic children, the Caucasian parents were 68.3% (n = 56), while the African American parents were 24.4% (n = 20) and other races were 7.3% (n = 6).

Table 1 shows the comparison before and after PCIT treatment for Hispanic, non-Hispanic and all participants. The "Intake ECBI Intensity Scale Raw Score" represents the scores before (pre PCIT) treatment and "ECBI score when CDI, PDI and ECBI criteria have been met (i.e., family COULD graduate)" represents the scores after (post PCIT) treatment. The mean improvement of ECBI score in Hispanic children is 52.81 (SD=29.67), while the mean in non-Hispanic children is 56.93 (SD=28.92). The mean ECBI score improvement in all cases is 57.45 (SD=30.38) with the 95% C I as51.54 – 63.36. Statistically significant difference was observed in the mean improvement of ECBI scores in Hispanic children (df=42, t-test= 11.67, P- value is <0.00) when compared to non-Hispanic children (df=26, t-test= 10.22, P- value is < 0.00.

In Table 2, the data showed the ECBI scores of children, regarding their early or late PCIT intervention. PCIT intervention was considered to be *early* when the child's age was <=4.4 years, while it was considered as late intervention, when the child's age was >4.4 years. The mean percentage of change before and after PCIT treatment in early intervention was -62.03 (36.49), while in late intervention it was-99.78 (67.36). Also, there was a statistically significant difference in the mean percentage of change during PCIT treatment (df=56.61, t-test= 3.27, P- value is <0.002). The results showed a statistically significant difference between early and late PCIT intervention at 95% C I (9.65 - 31.24). Also, it was observed that the mean score of delta change before and after PCIT treatment was -50.206 (SD=25.75) and -70.658 (SD=27.91), for those who started treatment early and late, respectively.

In Table 3, comparison of the improvement of ECBI score, pre PCIT and "post PCIT, between Hispanic and non-Hispanic groups. The mean of ECBI score was -55.85 (SD=26.81) and -56.92 (SD=28.92), in the Hispanic group and non-Hispanic group, respectively. . Further, among the Hispanic group, the mean child age when starting PCIT treatment was 3.92 (SD=1.44) years, while among the non-Hispanic group, the same was 4.50 (SD=2.04) years. There was no statistically significant difference between Hispanic and non-Hispanic groups in the improvement of ECBI score (df=1, anova-test= 18.71, P- value is 0.87).

Table 4 shows the comparison amongst the caregiver race/ethnicity with regard to PCIT in both Hispanic and non-Hispanic groups. Among the Hispanic group, the proportion of children who started early PCIT treatment was 61.2%, while among the non-Hispanic group it was 46.7%. Pearson Chi-Square tests revealed no statistically significant difference between the two groups (p= 0.206).

Table 5 illustrates the overall improvement of ECBI scores related to parents' level of education. There was a statistically significant difference in ECBI scores before and after PCIT treatment (df=4, ANOVA-test= 7258.84, P- value is < 0.043), (CI -100.907 to -2.8696) with regard to the parents' level of education. The mean improvement of ECBI score was higher among the parents with high school education. Among the Hispanic and Non Hispanic group, there were no statistically significant differences in scores before and after PCIT treatment with regard tothe parents' level of education (df=4, ANOVA-test= 1123.48, P- value is 0.190).

In Table 6, we compare parent's race/ethnicity and their level of education. The percentage of parents with a high school education is 14.3% among the Hispanic group, and 17.2% among the non-Hispanic group. Overall, there is no statistically significant difference between percentage of parent's race/ethnicity and their level of education.

Table-1: Difference between Intake ECBI Intensity Scale Raw Score (Pre PCIT) and ECBI score

Race	Mean Difference	95% Confidence Interval of the Difference	T - value (P-value)
All	57.45	51.54 to 63.36	19.28 (<0.001)*
Hispanic	52.81	43.68 to 61.95	11.67 (<0.001)*
Non-Hispanic	56.93	45.49 to 68.37	10.23 (<0.001)*

*Statistically Significant at 5% level

Table-2: Difference in ECBI scores between children receiving Early (<=4.4 years) and Late Intervention (>4.4 years)

Score	Time of intervention	Mean ± Std. Deviation	T - value (P – value)
Pre PCIT	early	137.89 ± 26.06	1.920
	late	145.44 ± 30.66	(0.056)
Post PCIT	early	86.95 ± 17.86	1.167
	late	82.33 ± 22.1	(0.246)
Percentages of change	early	62.03 ± 36.5	3.592
	late	99.78 ± 67.37	(0.002)*
Post PCIT - Pre-PCIT	early	50.21 ± 25.75	3.759 (0.000)*
	late	70.66 ± 27.9	

*Statistically Significant at 5% level

Table-3: Difference in ECBI scores between children receiving PCIT across race

Score	Race	Mean ± Std. Deviation	95% CI	F- value (p-value)
Percentage of change before and after treatment	hispanic	-72.13 ± 48.74	-87.52 to -56.75	0.613
	not hispanic	-83.73 ± 73.56	-112.83 to -54.63	(0.437)
	Total	-76.74 ± 59.59	-91.16 to -62.32	
post PCIT – pre-PCIT	hispanic	-55.85 ± 26.81	-64.32 to -47.39	0.024
	not hispanic	-56.93 ± 28.92	-68.37 to -45.49	(0.876)
	Total	-56.28 ± 27.46	-62.93 to -49.63	
Child_age_years	hispanic	3.92 ±1.44	3.50 to 4.33	2.192
	not hispanic	4.50 ± 2.05	3.74 to 5.26	(0.179)
	Total	4.14 ± 1.708	3.76 to 4.52	

Table-4: Timing of intervention among children with disruptive behavior disorders across race of parents

Time of intervention	Caregiver Ethnicity		Total	Chi square value (P-value)
	Hispanic	Non-Hispanic		
early (<=4.4)	61.2%	46.7%	55.7%	1.598
late (>4.4)	38.8%	53.3%	44.3%	(0.206)

Table-5: ECBI scores of children with disruptive behavior disorders – Overall, Hispanics and Non-Hispanics

Race	Variable	Educational level	Mean ± SD	95% CI	p-value
Overall	Percentage of change before and after treatment	high school	-121.17 ± 81.55	-168.26 to -74.09	0.043*
		Some college	-74.48 ± 78.04	-156.38 to 7.41	
		Associates	-77.26 ± 35.86	-104.82 to -49.69	
		College	-73.91 ± 49.94	-90.33 to -57.49	
		Grad school	-69.28 ± 38.81	-83.28 to -55.29	
		Total	-79.44 ± 54.88	-90.38 to -68.49	
	post PCIT - pre-PCIT	high school	-79.07 ± 34.58	-99.03 to -59.11	0.056
		Some college	-46.5 ± 27.25	-75.1 to -17.9	
		Associates	-65.33 ± 24.62	-84.26 to -46.41	
		College	-57.34 ± 28.52	-66.72 to -47.97	
		Grad school	-55 ± 25.08	-64.04 to -45.96	
		Total	-59.73 ± 28.78	-65.47 to -53.99	
Hispanics	Percentages of change before and after treatment	high school	-93.09 ± 58.98	-166.32 to -19.86	0.519
		Some college	-45.21 ± 14.42	-81.04 to -9.39	
		Associates	-100.73 ± 38.65	-162.24 to -39.23	
		College	-68.17 ± 57.51	-97.74 to -38.6	
		Grad school	-67.4 ± 38.43	-93.22 to -41.58	
		Total	-72.61 ± 49.26	-88.36 to -56.85	
	post PCIT - pre-PCIT intake	high school	-68.6 ± 29.86	-105.68 to -31.52	0.190
		Some college	-36 ± 11.27	-63.99 to -8.01	
		Associates	-79 ± 21.21	-112.75 to -45.25	
		College	-51.41 ± 26.7	-65.14 to -37.68	
		Grad school	-54.45 ± 27.66	-73.03 to -35.87	
		Total	-56 ± 27.14	-64.68to -47.32	
Non hispanics	Percentages of change before and after treatment	high school	-163.17 ± 139.4	-385.07 to 58.74	0.127
		Some college	-135.1 ± 137.82	-1373.39 to 1103.1	
		Associates	-75.99 ± 7.02	-139.04 to -12.94	
		College	-70.90 ± 27.55	-92.08 to -49.73	
		Grad school	-56.85 ± 45.2	-91.59 to -22.11	
		Total	-85.56 ± 74.39	-115.61 to -55.52	
	post PCIT - pre-PCIT intake	high school	-82.5 ± 53.55	-167.71 to 2.71	0.264
		Some college	-66 ± 48.08	-498.01 to 366.0	
		Associates	-72 ± 5.66	-122.82 to -21.18	
		College	-54.33 ± 16.05	-66.67 to -41.99	
		Grad school	-45.22 ± 21.58	-61.81 to -28.63	
		Total	-57.77 ± 29.15	-69.54 to -45.99	

*Statistically Significant at 5% level

Table-6: Caregiver educational level Vs Ethnicity

Caregiver's education level (screening packet)	Caregiver Ethnicity		Total (%)	95% CI	P-value
	Hispanic (%)	Non- Hispanic (%)			
High school	14.3	17.2	15.4	0.229 to 2.799	0.482
Some college	10.2	10.3	10.3	0.217 to 4.464	0.632
Associates	14.3	6.9	11.5	0.435 to 11.647	0.274
College	38.8	31.0	35.9	0.531 to 3.728	0.491
Grad school	22.4	34.5	26.9	0.199 to 1.522	0.247

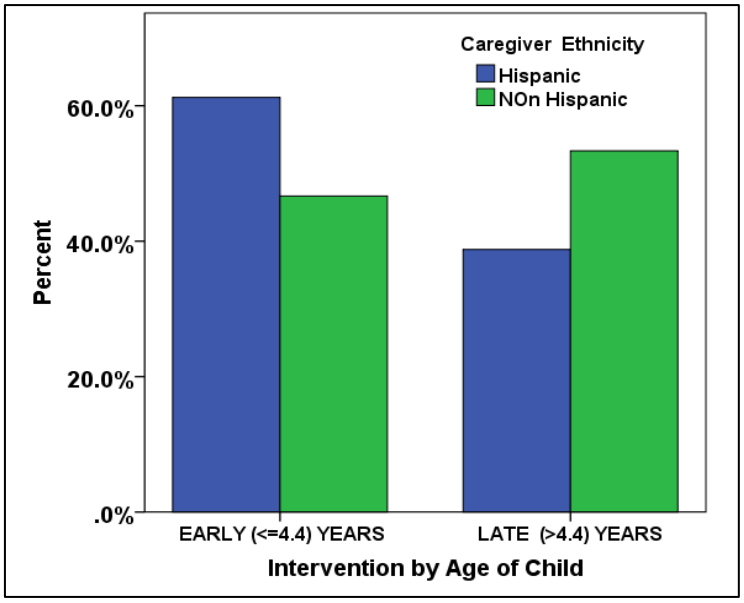

Fig-1: Bar graph for time of intervention among children and race of parents

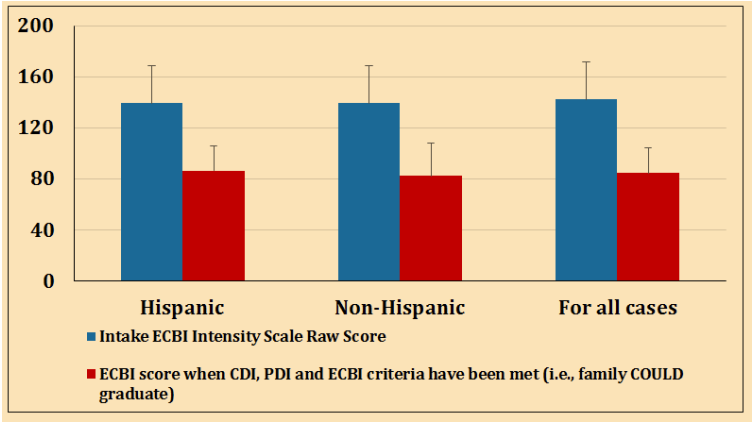

Fig-2: Pre and Post PCIT ECBI scores of children with disruptive behaviour disorders

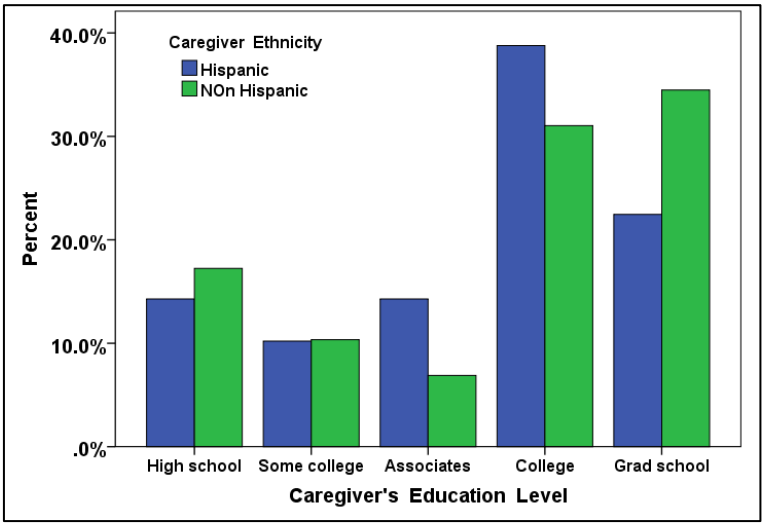

Fig-3: Caregiver's Education Level Stratified by Race

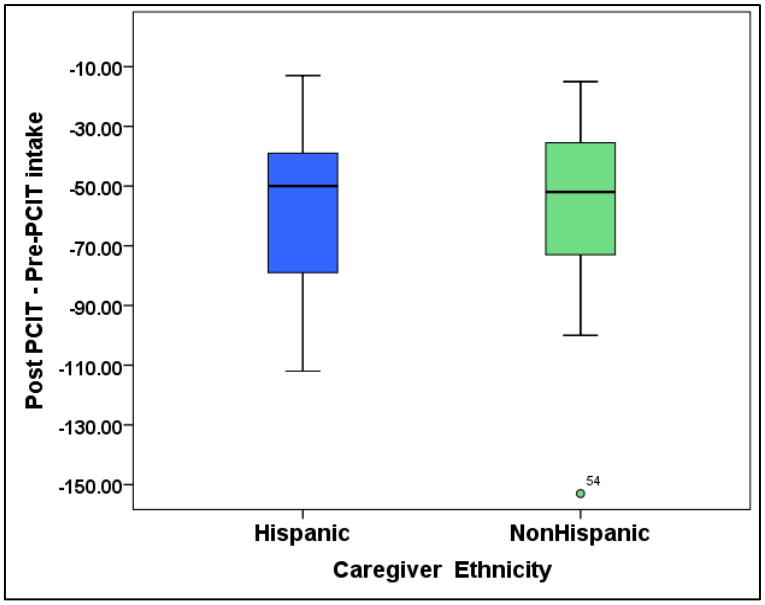

Fig-4: Difference between Pre and Post PCIT ECBI scores stratified by race

DISCUSSION

DBDs are common serious developmental disabilities [1]. Although no known cure has been identified for these disorders, early intervention after the diagnosis would improve the condition and provide optimum healthcare to a diseased child [1].

Many studies measuring early PCIT interventions and the improvement of ECBI scores due to sociodemographic factors are available. Nevertheless, there are only few studies that have described the role of cultural concepts in this intervention. The current study showed two main findings: 1) there was a statistically significant difference in overall improvement of ECBI scores between early and late PCIT intervention, and 2) there was no significant correlation between race/ethnicity and early PCIT intervention resulting in improved ECBI scores.

In addition, the influence of race / ethnicity and parental education levels on the improvement of ECBI scores when studied did not show any significant differences. Among Hispanic parents, there was a very slight increase in earlier PCIT intervention resulting in improved ECBI scores compared to non-Hispanic ones; however, the increase was not significant. A possible explanation for the higher scores among the Hispanic parents could be related to cultural factors like familism. Hispanic culture is believed to have supportive family relationships, health-related beliefs, attitudes and practices [17]. Understanding Hispanic health-related beliefs could help predict the influence of Hispanic parents on early intervention behavior.

Limitations

This study has several limitations. A significant limitation is the amount of missing data. During the analysis, it was necessary to select participants that had ECBI scores before and after PCIT treatment on record. Missing data could be attributed to the fact that some of the participants had only one of those ECBI scores (either before or after treatment) or the patient could not graduate after the PCIT treatment. Alternatively, it could be due to loss of data during data entry. Another limitation of the current study was the sample size. The sample size was small for parents who completed the PCIT treatment. The small sample size might increase the chance that the statistically significant differences were false positives. Consequently, this would increase the chance that some of the outcomes were insignificant.

Further, there was an unequal distribution between participants of various races /ethnicities contributing to selection bias. Non-Hispanic parents were more than Hispanic ones. An additional concern was that the current study was limited to only one measure of ECBI Intensity Scale for the analysis. Having both ECBI Intensity Scale and ECBI Problem Scale measures could have provided more accurate results and more statistically significant outcomes.

Recommendations

There is little known about the methodologies to measure early PCIT intervention related to the child's age. Thus, the present study might be limited when applied to the child's age receiving early PCIT treatment. The application of this study might also be limited when using the child's age as a factor to compare early PCIT interventions from the late ones. Theoretically, applying the new measure to calculate child's age in early PCIT interventions might be of help to implement a new intervention. However, practically, public health initiatives and psychologists need to make strategic decisions to implement such new measures. The authors recommend the researchers and public

health stakeholders to evaluate the improvement of early PCIT intervention. More studies related to early PCIT intervention and the improvement of ECBI scores would compare the methodology of the current study with other related studies. This in turn would facilitate the researchers and stakeholders' decisions to create the appropriate criteria for early PCIT intervention.

An additional recommendation of the current study is choosing the appropriate communication channel to disseminate early intervention behavior messages to the target audience. For instance, "Learn the Signs. Act Early" (LTSAE) is a public health awareness campaign that "aims to improve early identification of children with autism and other developmental disabilities [2]". It can disseminate information to the target audience about developmental milestones that a child should reach so that the parents themselves can discover the early signs of autism as well as DBD. Although the educational resources of most campaigns are available in both English and Spanish, they are not designed based on parental education levels or cultural factors. Campaign messages could be based on the target audience's cultural values, beliefs, perceptions and socioeconomic status. Future research on the cultural variables that influence early intervention behavior could provide valuable information.

Conclusion

Disruptive behavior disorders are serious childhood mental disorders. Although these disorders are incurable, they can be controlled to help the child have better quality of life. Early PCIT intervention could be the best way for the child to reach his or her optimum healthcare. While the results of the present study show overall improvements in early PCIT intervention of DBD issues, the results also illustrated that the minimal association between race/ethnicity and early PCIT intervention. Further research and sincere efforts of public health stakeholders are important in the implementation of effective health education programs and policies in order to increase the awareness of early PCIT intervention and its delivery methods. Further research on this aspect of behavioral and social sciences has the potential to advance public health efforts to control DBD.

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