

Parenting Stress Among Biological, Adoptive, Foster, and Guardian Parents of Children with Prenatal and/or Environmental Substance Exposure

Kristina Kochanova
Department of Psychology
Elmhurst College
190 Prospect Ave
Elmhurst, IL 60126

Faculty Sponsor: Dr. Catherine M. Gaze

Abstract

The presence of stress has been associated with unfavorable outcomes for both children and parents. Stressed parents are more likely to be negative, punitive, and withdrawn in interactions with children, which can lead to dysfunctional parent-child relationships and affect children's development negatively ^{1, 2}. Parental stress has been shown to be influenced by multiple sources, including characteristics of the parent and/or the child. For example, child characteristics like behavioral problems, mental illnesses, and disabilities have been associated with higher parental stress ^{3, 4, 5, 6}. The purpose of this study was to investigate parental stress in different types of parents (biological, adoptive, foster, and guardian) of children with substance exposure. A sample of 209 children (60.8% males) was drawn from a larger study, which evaluated children who were exposed to substances and collected data about psychological, physical, and family well-being. The sample for this study was drawn based on the availability of the Parenting Stress Index (PSI-3) data and demographic information. It was predicted that adoptive parents will have higher parenting stress on the PSI-3 than biological, foster, and guardian parents. A significant effect of parent type (biological, adoptive, foster, and guardian parents) on parenting stress was found. Biological parents reported significantly greater stress on the Parent Domain and Total Stress scale than foster parents on the PSI-3. Adoptive parents reported significantly higher stress on the Child Domain than foster parents and significantly higher stress than both foster and guardian parents on the Parent Domain and the Total Stress scale of the PSI-3. The findings partially supported the hypothesis because adoptive parents did have significantly higher stress than foster and guardian parents, but not significantly higher stress than biological parents. Additional analyses were done to explore relationships between reported stress and child substance exposure (prenatal/environmental) and child diagnoses (category and total number). Based on the results, it was concluded that biological and adoptive parents of children who were exposed to substances reported higher stress than foster and/or guardian parents. To prevent unfavorable outcomes of parental stress, biological and adoptive parents of children with substance exposure should receive greater intervention for development of stress coping skills.

Keywords: Parenting stress, substance exposure, at-risk children

1. Introduction

Stress is prevalent throughout our lives, is present in work, parenting, and school related domains, and may have negative effects on one's psychological and physical well-being. Specifically, parenting stress has been one of the most studied domains because the presence of stress has been associated with unfavorable outcomes for both children and parents. Stressed parents are more likely to be negative, punitive, and withdrawn in interactions with children, which can lead to dysfunctional parent-child relationships and affect children's development negatively ^{7, 8}. It is important to further study this topic to prevent unfavorable outcomes and design interventions to aid the development of parental coping skills.

Parenting stress is defined as “set of processes that lead to aversive psychological and physiological reactions arising from attempts to adapt to the demands of parenthood”⁹, which is the most widely used definition in research dealing with parenting stress. Parenting stress is experienced at one point or another by all parents regardless of socioeconomic status. All parents have to balance and meet the demands of parenting, which at times can be stressful. These parenting demands vary, but may include adapting to being a new parent, adjusting to the child’s characteristics, learning how to juggle work and parenthood, and meeting the child’s physical and emotional needs¹⁰. Poverty and unemployment were also reported to have negative affects on the relationships between parents and children. Parents of lower SES are less likely to use reason, show support, and to allow independence in children¹¹. Parents who do have more access to resources usually have less chronic stress and easier time meeting those demands, but still experience parenting stress because resources are not the only factors that can influence parenting stress. Other factors include qualities of relationships, lack of social support, mental illnesses, chronic illnesses, perceptions of parenthood, and characteristics of the parent and the child^{12,13}.

There are various approaches to assessing parenting stress, which are used in parenting stress research, like daily hassles approach that focuses on the typical and daily stresses of parenting. However, the most widely researched and utilized approach in investigations of parenting stress is the Parent-Child-Relationship (P-C-R) theory. The P-C-R theory focuses more on larger issues and life events, pathological stress experiences, and problems related to parental distress and child difficulties than the daily hassles approach¹⁴. The assumption of P-C-R theory is that parent’s characteristics (e.g., anxiety) and child’s characteristics (e.g., severe misbehavior) are likely to contribute and change parent-child relationships.

There are three domains that make up the P-C-R theory, which are parent, child, and parent-child relationship domains. The parent domain includes aspects of parenting stress that arise due to parents’ relationships, characteristics (e.g., age, gender, mental and/or physical illness, and perceptions) and experiences¹⁵. Several investigations looked at the parenting stress aspects of the parent domain and its causes and/or affects on the parent-child relationships. Specifically, parents’ characteristics of mental illnesses and perceptions have been investigated in parenting stress research. Psychological state of parents is an important factor because it can potentially damage the parent-child interaction and have adverse outcomes for the development of the child. Mental illnesses like depression have been found to interfere with various aspects of parent-child relationship because parents who have depression are more likely to interact with their children in less rewarding ways, which can add to the distress they already experience¹⁶. Mental illnesses can have an influence on the parental perception of certain events as being stressful, such as child’s misbehavior, and can further contribute to parental stress and dysfunctional parent-child relationships. However, parental perceptions are not only influenced by mental illnesses and can vary significantly between parents. Some parents may perceive their child’s misbehavior as an indication that the child is just tired or had a bad day, while others may view it as an indication of failure as a parent or as the child misbehaving on purpose to upset the parent. It was reported that parents who perceive the child’s misbehaviors and crying to occur due to their child’s willful intentions are more likely to have a higher stress reaction to these events and hold their child accountable for these behaviors¹⁷. These parental perceptions vary due to culture, individual differences, and at times mental illnesses. Nevertheless, the differences in parental perceptions may indicate why certain parents cope better than others when experiencing parenting stress. All of the parents’ characteristics that are a part of the parent domain are important because they can provide information about the cause and effect of parenting stress and the affect it can have on parent-child relationships, which were taken into account in this study.

The P-C-R theory has a second domain that is also important for investigation of parenting stress and parent-child relationships. This second domain is the child domain, which mainly focuses on aspects of parenting stress that arise from children’s characteristics (e.g., behavioral problems, psychological problems, and disorders) that may result in negative parent-child relationships¹⁸. The child domain is as equally important as the parent domain in the P-C-R theory and is an important component in parenting stress research. Children’s characteristic of behavioral problems has been thoroughly studied in the parenting stress research. Several investigations report that children’s behavioral problems were significantly affecting parenting stress because parents who had children with behavioral problems were more likely to report higher parental stress^{19, 20, 21, 22}. These findings indicated that behavioral problems are an important characteristic of children that should be explored in this study.

Behavioral problems are not the only children’s characteristics that affect parenting stress and parent-child relationships, psychological problems and disorders do as well. Children with behavioral problems can be exhibiting aggression, hyperactivity, inattention, and noncompliance due to certain disorders like attention deficit hyperactivity disorder (ADHD), conduct-disorder (CD), and fetal alcohol spectrum disorders (FASD). These types of disorders are a part of externalizing problems because this category includes behavioral problems like aggression, delinquency, attention difficulties, and conduct problems that mostly result in diagnosis of these disorders, while internalizing problems are those that include being withdrawn, disturbance in emotions and mood, somatic

complaints, and are mostly related to anxiety and depression²³. Disorders in general are connected to parenting stress, which may not come as a surprise to many people because having a child with a disorder will produce stress. However, previous studies have shown that there is a difference in what types of disorders produce more parental stress, which can potentially help identify parents who need greater intervention to prevent negative outcomes for children and parents. Findings indicated that disorders related to externalizing problems tend to produce more parental distress²⁴. One main reason is that children with disorders related to externalizing problems tend to have more severe behavioral problems, which can add to parental distress. For instance, families with conduct-disorder children report higher rates of major stressful life events. Amount of negative life stress for clinic families was twice as high as for non-clinic families²⁵.

Fetal alcohol spectrum disorders are also a part of the externalizing problems category, which means that parents with children who have FASD also are more likely to experience parenting stress and this can have negative outcomes for the parent-child relationships and child development. FASD is an umbrella term for a group of conditions, which includes Fetal Alcohol Syndrome (FAS), Alcohol-Related Neurodevelopmental Disorder (ARND), and Alcohol-Related Birth Defects (ARBD), that a child may have due to prenatal alcohol exposure. FAS is the most severe of the FASD diagnoses and individuals with FAS can have central nervous system problems, abnormal facial features, growth problems, have often hard time in school and communication, and problems with memory, learning, hearing, vision, and/or attention span^{26, 27}. Individuals diagnosed with ARND may have behavioral and learning problems, intellectual disabilities, do poorly in school, and have difficulties with memory, math, judgment, poor impulse control, and/or attention²⁸. Children diagnosed with ARBD usually have problems with hearing, bones, kidneys, and/or heart²⁹. Having a child who has been diagnosed with FASD is stressful due to parental guilt (biological parent), behavioral problems of the child, and various physical, social, and school related problems experienced by a child with FASD. In fact, children who have more difficult time acquiring cognitive, motor, behavioral, and social skills, which are usually experienced by children with FASD, are more likely to have parents who are more distressed, less warm and affectionate, and less stimulating³⁰. This can have detrimental affects on the parent-child relationships and child development.

The amount of alcohol a child was exposed to prenatally can make a difference in the degree of problems and difficulties they are experiencing, which can make a difference in the degree of parental distress, warmth, affection and stimulation a child with FASD receives. One study investigated the relationship between dose of alcohol exposure and dysfunction in real life adolescent learning and behavior³¹. It was found that as the dose of alcohol exposure increased so did the problems in adolescent behavior and learning, especially when the mother drank alcohol at an early period of the pregnancy and/or engaged in binge drinking³². The results may suggest that parents of adolescents who have been exposed to higher doses of alcohol have the most parental distress and the least warmth, affection, and stimulation. A more recent investigation mainly focused on the affect of FASD diagnoses labels on parenting stress. It was found parenting stress was not related to FAS, ARND, and partial FAS diagnosis labels, but parenting stress was associated with poorer executive and adaptive functioning and higher levels of externalizing behaviors in children³³. These findings indicated that parenting stress is not induced due to the FASD labels, but due to the actual maladaptive behaviors exhibited by the children who have FASD. Based on the findings discussed above, FASD can contribute to higher parental stress and needs to be further investigated. The current study contains a sample of children who have FASD and/or were prenatally and/or environmentally exposed to substances, which will be further investigated to help parents and guardians of children with FASD and/or prenatal/environmental substance exposure develop important stress coping skills.

The third domain of the P-C-R theory is the parent-child relationship domain that also contributes to parenting stress. The parent-child relationship domain contains aspects of parenting stress that arise from within the parent-child relationship due to problems in the parent-child interaction, such as conflict, hostility, and the belief that the relationship is not meeting expectations and is no longer rewarding³⁴. Co-regulation of emotional states between child and parent is very important for the parent-child relationship and development³⁵. When co-regulation does not occur dysfunctional parent-child relationships develop. Consistently dysfunctional parent-child relationships can lead to child abuse, which is why it is important to investigate parent-child relationships to prevent any harm to the child and the parent. The parent-child relationship domain is also highly influenced by the child and parent domain because the P-C-R theory is transactional. This means that all of the three domains influence one another and are not exclusively separate entities. For instance, child's behavioral problems can produce parenting stress in parents and influence parent's mental health by producing depression. At the same time parent's depression can cause the parent to engage less with the child, which in turn may produce and increase behavioral problems. Then both of the above put together can influence the parent-child relationship by creating tension within the relationship that can be dysfunctional and in turn further increase child's behavioral problems and parent's depression and stress. The P-C-R

theory is the most widely researched and useful approach to investigating parenting stress, which is why it will be utilized in this study.

The P-C-R theory is also the main approach used in the Parenting Stress Index (PSI), which is a common measure used to assess parenting stress. The PSI is a measure that was designed by Richard R. Abidin to identify parenting stress, dysfunction in parent-child systems, child abuse risks, and treatment and intervention planning. The PSI is conceptually and methodologically different from everyday stressors of parenting represented by the daily hassles approach. The main reasons are that PSI usually is administered to clinical populations and focuses more on problems of general dysfunctional parent-child relationships, parental distress, and children's difficulties^{36, 37}. The PSI consists of four scales, which are Defensive Responding, Total Stress, Child Domain, and Parent Domain. The PSI is a reliable and valid measure that was normed on various clinical populations with physical disabilities, various psychological disorders, and traumas³⁸. Because the PSI is a reliable and valid tool that is commonly used in the field today it will be utilized in the current study.

Recently, there is a growing interest in investigation of parenting stress among biological, adoptive, foster, and guardian parents to determine if there is a difference in parenting stress between these parent types. There are only a few studies regarding this topic, which demonstrates a need for further investigation. One study evaluated families whose children were institutionalized for at least 8 months in Romania called the RO group³⁹. Two other comparison groups were evaluated, Canadian-born non-adoptive children (CB group) and families with Romanian adopted children who have been in orphanages less than four months (RC group). It was found that child domain scores and parental stress were higher in RO group than in comparison groups⁴⁰. It seems that there is a difference in parenting stress depending on the parent type. Also, children who are in foster, guardian, or adoptive care experience disorders and psychological problems, which shows that not only biological parents may experience parenting stress due to children's characteristics. For instance, another investigation found that most of the adoptees in their study had ADHD and that children with disorders like ADHD were primarily adopted by nonrelatives⁴¹. It can be assumed that biological, adoptive, foster, and guardian parents all experience parenting stress to some extent, but the lack of studies investigating all of the four parenting types does not allow specific conclusions to be made about which parent type experiences more parenting stress.

Due to the lack of studies investigating all of these parent types, the current study will primarily focus on exploring parenting stress among different types of parents (biological, adoptive, foster, and guardian) of children with prenatal and/or environmental substance exposure. The first question of this study asked if parenting stress is different among biological, adoptive, foster, and guardian parents of children who were prenatally and/or environmentally exposed to substances. According to several sources, adoptive parents tend to report higher parenting stress than other parents possibly due to adoptive parents not being as attuned to the child's needs because they have just adopted the child and/or are not prepared to deal with the child's disorders and other problems^{42, 43, 44}. Due to these sources, it was predicted that adoptive parents will have higher parenting stress on all of the PSI-3 scales (Child Domain, Parent Domain, and Total Stress) than biological, foster, and guardian parents.

The second question of this study asked how does the child's diagnosis contribute to parenting stress. Because previous investigations indicated that children's externalizing disorders tended to elicit higher parenting stress⁴⁵, it was hypothesized that parents of children who were diagnosed with both externalizing and internalizing disorders would have higher child related parenting stress (Child Domain) than parents of children who received externalizing only or internalizing only diagnoses. The third question asked what effect does the type of substance exposure (prenatal and/or environmental) have on parenting stress and the number of diagnoses a child receives. For the first part of the question, it was predicted that parents of children who were prenatally and environmentally exposed to substances would have higher child related parenting stress (Child Domain) than parents of children who were only prenatally exposed or only environmentally exposed to substances. For the second part of the question, it was predicted that children who were both prenatally and environmentally exposed to substances would have higher number of diagnoses (out of four) than children who were prenatally only or environmentally only exposed to substances. This prediction was based on the findings of a study that indicated as the dose of alcohol increased, so did the behavioral, cognitive, and psychological problems of the children⁴⁶.

2. Method

2.1. Participants

A total sample of 238 children was drawn from a larger study, which evaluated prenatally and/or environmentally exposed children at a rural mental health clinic between 2008 and 2011. Twenty-nine children were taken out of the sample due to ineligibility because they had no environmental and/or prenatal substance exposure. The sample ($N = 209$; 60.8% males; age range from 1 month to 19 years old) for this study was drawn based on the availability of the Parenting Stress Index (PSI-3) data, prenatal and/or environmental substance exposure (46.9% prenatally exposed, 26.8% environmentally exposed, and 27.3% exposed to both), and demographic information. Of the 209 children 30.1% were placed with biological parents, 31.1% were placed with adoptive parents, 24.9% were placed with foster parents, and 13.9% were placed with guardians. For further demographic information please refer to Table 1.

Table 1. demographic information

Characteristics	Placement Type									
	Combined		Biological		Adoptive		Foster		Guardian	
	$(N = 209)$		$(n = 63)$		$(n = 65)$		$(n = 52)$		$(n = 29)$	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Race										
AA	66	31.6	12	19	14	21.5	26	50	14	48.3
Caucasian	121	57.9	48	76.2	41	63.1	22	42.3	10	34.5
Hispanic	1	0.5	0	0	1	1.5	0	0	0	0
Asian	1	0.5	0	0	1	1.5	0	0	0	0
Mixed	20	9.5	3	4.8	8	12.3	4	7.7	5	17.2
Age										
Less than 2	26	12.4	5	7.9	1	1.5	14	26.9	6	20.7
2-5	60	28.7	17	27	9	13.8	19	36.5	15	51.7
6-10	78	37.3	25	39.7	31	47.7	16	30.8	6	20.7
11 +	45	21.5	16	25.4	24	37	3	5.8	2	6.9

2.2. Materials

All of the participants received psychological, physical, and family well-being evaluations at a rural mental health clinic from 2008 to 2011. Children and their families were given a wide range of psychological measures. Only the demographic data and the Parenting Stress Index (PSI-3) were used in the present study. Available demographic information included birth date, evaluation date, diagnoses, placement type, and substance exposure type of each child.

The PSI-3 is a reliable and valid measure used in the larger study to evaluate parenting stress and consists of 120 items that are answered by parents or guardians of the child in about 30 minutes. There are four scales on the PSI-3, which are Defensive Responding, Total Stress, Child Domain, and Parent Domain. The main focus of this study was

on the Total Stress, Child Domain, and Parent Domain scales. The Total Stress scale reports the total stress from all of the scales combined, except the Life Stress subscale that is optional. A total score of at or above 260 is an indication for a need of a referral for a consultation and that high parenting stress exists that may be harmful to the parent and the child ⁴⁷.

The Child Domain scale measures aspects of the child from the child domain discussed previously in P-C-R theory that contribute to parenting stress. A high score on the Child Domain indicates that certain qualities of the child make it difficult for a parent, which produces stress. Specifically, if the Child Domain score is higher than the Parent Domain score, then child characteristics contribute more to the parenting stress ⁴⁸. The 47-item Child Domain scale has six subscales.

The Parent Domain scale includes components of the parent domain from the P-C-R theory, such as parents' characteristics, experiences, and perceptions. A high score on the Parent Domain indicates that certain qualities of the parent and parenting functioning produce parenting stress. Usually younger parents and previously less involved parents will have higher scores on the Parent Domain and tend to feel overwhelmed and inadequate as parents ⁴⁹. The 54-item Parent Domain scale has eight subscales.

2.3. Procedure

In the larger study, children were referred by DCFS, Pediatricians, and/or mental health specialists for an evaluation at a rural mental health clinic from 2008 until 2011. A federal grant was obtained to cover the costs of psychological, physical, and family well-being evaluations of all eligible participants. Eligibility was determined by recorded or reported environmental and/or prenatal substance exposure. A child was positive for environmental exposure if they are around drug paraphernalia or drug/alcohol/tobacco use by anyone in the home. A child was positive for prenatal substance exposure if their biological mother used substances (alcohol, heroin, nicotine, cocaine, marijuana, opiates, prescription drugs, and/or methamphetamines) while pregnant with the child in question. All of the children were evaluated by a psychologist and administered a variety of measures, including the PSI-3. The physical evaluation consisted of standard physical check up and evaluation for FASD by a pediatrician. Each client was recommended additional services, such as psychotherapy and subspecialist follow up based on case-by-case evaluation. All of the evaluations were entered into an Access and SPSS databases and sent to a Chicago downtown location of Children's Research Triangle.

The current study utilized the stored databases by drawing a sample of children who were in the primary database and had the PSI-3 data. The selected sample of children that met the criteria were located in various databases on Access and SPSS, which was found utilizing the previously assigned child identification and merged into one SPSS file. To control for the wide age range of the children, age-based percentiles from the PSI-3 scales (Child Domain, Parent Domain, and Total Stress) were used for all analyses instead of the raw scores.

3. Results

3.1. Differences In Parenting Stress Among Parent Types

Data were obtained from 209 children's evaluations at the rural mental health clinic. To determine parenting stress differences among biological, adoptive, foster, and guardian parents, age-based percentiles from the three scales (Child Domain, Parent Domain, and Total Stress) of the Parenting Stress Index (PSI-3) and parent types were analyzed using a multivariate analysis of variance (MANOVA). A significant effect of parent type (biological, adoptive, foster, and guardian) on parenting stress was found, Wilks' $\lambda = .864$, $F(9, 494.199) = 3.4$, $p < .001$. For specific means by parent type and PSI-3 scales refer to Table 2.

Table 2. Parenting Stress By Group

	Biological (<i>n</i> = 63)		Adoptive (<i>n</i> = 65)		Foster (<i>n</i> = 52)		Guardian (<i>n</i> = 29)		
PSI-3 Scale	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	Sig.
Child Domain	85	26.9	92.9	12.9	76.2	28.1	81.6	25.4	Yes
Parent Domain	60.9	30.7	65.8	26.1	43.7	31.9	48.3	32.7	Yes
Total Stress	78.4	28.3	83.9	20	59.4	33.2	66.7	31.4	Yes

Note. Age-based percentiles were used for all of the PSI-3 scales and the above numbers represent percentiles and not raw scores.

Follow-up univariate ANOVAs indicated that Child Domain percentiles were significantly different by parent type ($F(3, 205) = 5.062, p = .002$), Parent Domain percentiles were significantly different by parent type ($F(3, 205) = 6.425, p < .001$) and Total Stress percentiles were significantly different by parent type ($F(3, 205) = 8.685, p < .001$). Post-hoc analyses indicated significant differences among the groups. For the Child Domain adoptive parents reported significantly higher parenting stress than foster parents ($p = .001$). The Parent Domain results indicated biological parents reported significantly greater parenting stress than foster parents ($p = .013$) and adoptive parents reported significantly higher parenting stress than foster ($p = .001$) and guardian ($p = .046$) parents. The Total Stress results demonstrated biological parents reported significantly higher parenting stress than foster parents ($p = .002$) and adoptive parents reported significantly greater parenting stress than foster ($p = .000$) and guardian ($p = .031$) parents. It was expected that adoptive parents would have higher parenting stress than biological, foster, and guardian parents across all of the PSI-3 scales. The results demonstrated that the hypothesis was partially supported because adoptive parents did have significantly higher parenting stress than foster and guardian parents, but not significantly higher than biological parents.

3.2. Differences In Parenting Stress By Diagnostic Category

The analysis focused on participants' evaluations with the PSI-3 and diagnoses data. The diagnoses data included five diagnostic categories, which were externalizing only, internalizing only, both, other, and none. The externalizing only category included attention and behavioral problems (e.g., ADHD), which included 23% of the 209 children. The internalizing only category had mood and anxiety disorders, which included 27.8% of the children. The both diagnostic category included both internalizing and externalizing disorders, which had 15.3% of the children. The other category contained cognitive and developmental disorders (e.g., learning disabilities), which included 18.2% of the children. The none category meant that the children did not receive any diagnoses, which was the case for 15.8% of the children in the study. To test differences in parenting stress based on child externalizing only, internalizing only, both, other, and none diagnostic categories, a multivariate analysis of variance (MANOVA) was calculated. A significant effect of diagnostic category was found, Wilks' $\lambda = .805, F(12, 534.733) = 3.8, p < .001$. The means by diagnostic category and PSI-3 scales can be found in Table 3.

Table 3. Parenting Stress By Diagnostic Category

	Externalizing (<i>n</i> = 48)		Internalizing (<i>n</i> = 58)		Both (<i>n</i> = 32)		Other (<i>n</i> = 38)		None (<i>n</i> = 33)		
PSI-3 Scale	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	Sig.
Child Domain	90	17.6	85.7	24.6	97	4.6	79.6	28	69.8	29.9	Yes
Parent Domain	64.6	29.3	63.3	27.3	58.7	30.3	52.2	30.9	35	32	Yes
Total Stress	79.6	26.2	79.2	26.7	85.9	14.1	67.4	31.8	51.4	33.8	Yes

Note. Age-based percentiles were used for all of the PSI-3 scales and the above numbers represent percentiles and not raw scores.

Follow-up univariate ANOVAs and post hoc analyses indicated significant differences on the Child Domain, Parent Domain, and Total Stress. The Child Domain percentiles were significantly different by diagnosis types ($F(4, 204) = 6.925, p < .001$), where parents of children who received no diagnosis reported significantly less parenting stress than parents with children who received externalizing only ($p = .001$), internalizing only ($p = .015$), and both externalizing and internalizing ($p = .000$) diagnoses. Also, for the Child Domain parents reported significantly higher stress when their children had both externalizing and internalizing diagnoses than parents of children with other category diagnoses ($p = .015$). The Parent Domain percentiles were significantly different by diagnosis types ($F(4, 204) = 6.229, p < .001$), where parents of children who had no diagnosis reported significantly less parenting stress than parents of children with externalizing only ($p = .000$), internalizing only ($p = .000$), and both externalizing and internalizing ($p = .013$) diagnoses. The Total Stress percentiles were also significantly different by diagnosis types ($F(4, 204) = 8.720, p < .001$), where parents of children with no diagnosis reported significantly less parenting stress than parents of children with externalizing only ($p = .000$), internalizing only ($p = .000$), and both externalizing and internalizing diagnoses ($p = .000$). Also, for Total Stress parents with children who received both internalizing and externalizing diagnosis had significantly higher parenting stress than parents with children who had other diagnoses ($p = .042$). It was predicted that parents of children with both externalizing and internalizing diagnoses would have higher parenting stress on the Child Domain. These results did not support the hypothesis because the both category was only significantly different more than the other category on the Child Domain and the Total Stress, while the no diagnosis category was significantly different than externalizing, internalizing, and both diagnostic categories across all of the PSI-3 scales.

3.3. Influence Of Exposure Type On Stress And Diagnoses

The data analyzed came from children's evaluations that had the information about the type of substance exposure, number of diagnoses, and parenting stress. First a multivariate analysis of variance was calculated examining the effect of substance exposure type (prenatal, environmental, or both) on parenting stress. It was determined that no significant effect of substance exposure type on parenting stress was found, Wilks' $\lambda = .979, F(6, 408) = .7, p > .05$. Then a univariate analysis of variance was calculated to determine the effect of the substance exposure type on the number of diagnoses children received, which also did not produce any significant effects, $F(2, 206) = 1.291, p > .05$. It was expected that parents of children with both environmental and prenatal exposure would have higher parenting stress on the Child Domain and that the children with prenatal and environmental exposure would have higher number of diagnoses. These results did not support the predictions because no significant differences were found.

4. Discussion

The first question of this investigation asked if parenting stress is different among biological, adoptive, foster, and guardian parents of children with prenatal and/or environmental exposure. It was predicted that adoptive parents would have higher parenting stress on all of the PSI-3 scales (Child Domain, Parent Domain, Total Stress) than the rest of the parents. Even though the percentile means across all scales were higher for adoptive parents, this hypothesis was not fully supported because adoptive parents had significantly higher reported stress than foster and guardian parents only and biological parents also had significantly higher reported stress than foster parents. Based on these findings, adoptive and biological parents of children with prenatal and/or environmental substance exposure reported higher parenting stress, but the source of their stress varied. For instance, biological parents' stress was significantly higher on the Parent Domain, which suggested that their stress came from their own characteristics (e.g., poor coping skills and/or substance abuse). Adoptive parents' stress was significantly higher on the Child and Parent Domains, which suggested that their parenting stress came from the children's characteristics (e.g., behavioral problems) and the parents' characteristics (e.g., poor coping skills). These findings do not support the results found by another investigation that found adoptive parents of Romanian orphans had higher parenting stress than biological parents of Canadian children⁵⁰. This can be possibly explained due to the differences in populations studied where in this study both biological and adoptive parents have at-risk children (prenatally and/or environmentally exposed to substances) making them more similar than the parents of the Romanian orphans and Canadian children. Also, the biological parents from this population exposed their children to substances, which might make them feel guilty and have a unique type of parenting stress that could not be present in biological parents of Canadian children without substance exposure.

The second question of this investigation asked how does the child's diagnosis contribute to parenting stress. It was expected that parents of children who were diagnosed with both externalizing and internalizing diagnoses will have higher child related (Child Domain) parenting stress than parents with children who received externalizing only or internalizing only diagnoses. This prediction was not supported because the percentile means for the both category were higher than the other category, but they were not significantly different from the externalizing only and internalizing only categories. The results suggested that having some type of diagnosis contributed more to parenting stress than having no diagnosis at all. This study's findings are explained by the findings done in previous studies where externalizing disorders tended to elicit higher parenting stress, but variations in the severity of parenting stress still existed where other factors in the parents' life can contribute to the severity of the stressful reaction^{51, 52}. This means that in this case the variability between families and other variables could have possibly resulted in only the trend of higher percentile means for the both diagnostic category.

The third question of this investigation asked what effect does the type of substance exposure has on parenting stress and the number of diagnoses a child receives. It was hypothesized that parents with children who were both prenatally and environmentally exposed to substances would have higher parenting stress on the child domain than the parents of children with prenatal only and environmental only exposure. This hypothesis was not supported because no significant effect of substance exposure type on parenting stress was found. However, the percentile means for the both exposure category were higher than the other exposure types, which suggested that other variables might have contributed to the trend. Secondly, it was predicted that the children who were both prenatally and environmentally exposed to substances would have higher number of diagnoses (out of four). This prediction was also not supported because there were no significant effects of exposure type on the number of diagnoses found and the mean number of diagnoses was higher for the both exposure type, which indicated another trend. This trend was partially supported by the findings of a different study that found as the dose of alcohol exposure increased so did the psychological problems⁵³, but the findings from this study were only trends possibly due to the prenatal and environmental exposure category being made up of wide range of substances (e.g., cocaine, methadone, alcohol, and tobacco) and not only alcohol.

Based on these findings, adoptive and biological parents of children with prenatal and/or environmental substance exposure should receive interventions for developing coping skills. The development of coping skills would most likely prevent child abuse and dysfunctional parent-child interactions, which would have benefits for both children and parents. One limitation of this study was that it was drawn from an existing database, which put boundaries on the type of data available and the type of questions/variables that could be explored in the current study. Nevertheless, there are many questions that still remain regarding this particular population and future studies would look at other available variables to address the found trends for the second and third research questions. Perhaps age, employment, relationships status, and length of placement have an effect on the results discussed above. I plan to

continue with follow-up analyses to focus on these variables and add to the knowledge of parenting stress in this specific population of children who were prenatally and/or environmentally exposed to substances.

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