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Examining the Association Between Well Child Care and Developmental and Behavioral Health Conditions in Children

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ABSTRACT

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Behavioral Health Conditions in Children

By
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Background: Well child care visits (WCC) are critical preventive care visits that start at infancy. Currently, little is known about the association between WCC and parent report of developmental and behavioral health conditions in children. The purpose of this research was to examine if WCC contributes to developmental/behavioral health conditions reported by parents.

Methods: The 2016 National Health Interview Survey data were used for this research. Weighted estimates were calculated to assess the relationship between the receipt of WCC (yes or no response to receiving WCC in past 12 months) and presence of developmental/behavioral conditions; a Pearson's chi square was used to determine bivariate associations between characteristics and WCC, followed by multivariable logistic regression to adjust for child sex, child age, healthcare access of parents, parent education level and parent income level.

Results: Among 2,453 children 3 years and younger 91.04% of these children had received WCC in the past 12 months. The weighted percent of children with any developmental/behavioral conditions was 7.78% in those receiving WCC and 4.62% in children not receiving WCC. Bivariate associations determined that the statistically significant characteristics for determining whether a child receives WCC are: the child's race/ethnicity, the number of office visits to their primary care (which are a combination of WCC and sick child visits), parent education level, and combined family income level. The logistic regression model evaluating developmental and behavioral conditions adjusted for these variables that were statistically significant. In the adjusted model it was found that the number of office visits and parent education level were statistically significant in the detection of developmental and behavioral health conditions.

Conclusion: The number of office visits (which include WCC) are important preventive clinical services for identifying developmental/behavioral conditions in young children. Parent education level is another significant factor that determines receipt of WCC and detection of developmental/behavioral conditions. By understanding the factors associated with WCC, targeted interventions can be developed to increase identification of developmental/behavioral conditions.

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Author's Statement Page

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Chapter One: Introduction

Government programs and parent's insuring agencies provide children with proper preventative care and medical care. The American Academy of Pediatrics highly recommends well child care (WCC) visits as an important role in prevention, proper development, and raising concerns for children (AAP, 2017). These visits are important for monitoring not only the physical development of a child but the cognitive development as well. These visits are where a child is screened for developmental/behavioral delays and conditions.

Adherence to well child care (WCC) visits over time is not well understood, especially when evaluated across racial groups, poverty status, parent education status, and other subgroups (Abdus, et al. 2013). Child Preventive Care in association with low-income households and long-term health benefits has not been well studied. There has been very little research conducted on how adherence to WCC affects child health outcomes. A study done on "Clinical Practice Redesign for Serving Low Income Children" noted that measuring time the physician spends with the parent and child is very important in determining the quality of these visits. The study found that the more time the physician spent, the more likely the parent was to recommend these visits to another parent as well as return for subsequent visits (Coker, et al. 2014). It is important to note healthcare access as a limitation to well child care as well. To improve healthcare access to low-income families Centering Parenting has been considered a desirable model of group dyad care. This model provides care for mothers and infants and has been considered a feasible option at Federally Qualified Health Centers (Duran, et al. 2017).

There has also not been adequate research done on how WCC visits correspond to the detection of developmental and behavioral conditions. These developmental and behavioral conditions are: ADHD, autism/autism spectrum disorders, cerebral palsy, developmental delays, and intellectual disability. The American Academy of Pediatrics recommends developmental/behavioral assessment beginning at 9 months, reassessment at 18 months, and 30 months; where after these time points assessment is done based on parent concern. Developmental surveillance is done at each WCC visit and continues through age 21 years. Autism screening is done at 18 months of age and again at 24 months of age. After these two recommended screenings for Autism, screening is conducted on an individual basis and based on parent concern (AAP, 2017).

The main research question I propose to answer is, do parent-report of well child care visits contribute to a greater proportion of reported diagnosed developmental and behavioral health conditions? I hypothesize that reports of well child care will be associated with developmental and behavioral health conditions. The reason this question is of such high concern is due to the fact that children rely on their parents and/or guardians to obtain quality care and determine the outcomes of their care (Mangione-Smith, et al. 1998). It is thus important to understand who receives these WCC visits and who does not. It is understood by the American Academy of Pediatrics that children who receive these visits have better health outcomes overall, and better developmental surveillance and developmental/behavioral condition detection over time (AAP, 2017).

Chapter Two: Literature Review

The Importance of Well Child Care (WCC)

The importance of pediatric primary care cannot be overstated when in the 2014 National Health Interview Survey (NHIS) 16.2 percent of children did not receive a WCC visit in the last 12 months when not sick or injured (CAHMI, 2017). In this same year NHIS found that in children ages 0-5 years 24.2 percent of these children received 0-1 office visits to their primary care pediatrician. The American Academy of Pediatrics delivers "Recommendations for Preventive Pediatric Health Care" guidelines that represent a consensus on comprehensive health supervision. These guidelines represent a standard of care that pediatricians and parents refer to. In the first year of life it is recommended that an infant receive seven office visits for physical examination, immunizations, developmental assessment, sensory screening, and body measurements by their pediatrician (AAP, 2017).

These WCC visits are the primary source of information and only opportunity for parents to address concerns about their children's health, behavioral, and developmental issues (Coker, et al. 2015). WCC in the first three years of life is critical for identifying these important health concerns before the child enters preschool, to improve their learning experience (Mimila, et al. 2017). These visits act as preventive care for children and primary sources of advocacy for parents. When parents do not receive adequate WCC from providers they tend to feel their concerns were unaddressed and seek emergency department care when health problems arise instead of seeking their provider (Mimila, et al. 2017).

If we are to reach the Maternal Infant and Child Health outcomes for Healthy People 2020, WCC needs to be of the utmost importance. The objective of importance for this research states: (1) Increase the proportion of young children with autism spectrum disorder (ASD) and other developmental delays who are screened, evaluated, and enrolled in special services in a timely manner. Where baseline is: 22.6 percent of children aged 10 to 35 months were screened for Autism Spectrum Disorder (ASD) and other developmental delays in the past year as reported in 2007, and the future goal is a 10 percent improvement, with a target of 24.9 percent of children screened, evaluated, and enrolled.

These objectives are in hopes of detection, evaluation, and enrolling these children in specialty services with the unique ability to address these chronic developmental conditions (ODPHP, 2018).

Quality of Pediatric Primary Care/WCC

The quality of care received at WCC visits is worth mentioning because it sets a tone for parent health seeking behaviors in the future for their child. If a parent feels that their concerns were not addressed they are less likely to return to their provider, which accounts for increased emergency department use for primary pediatric care. A study done on "Clinical Practice Redesign for Serving Low Income Children" noted that measuring time the physician spends with the parent and child is very important in determining the quality of these visits. The study found that the more time the physician spent, the more likely the parent was to recommend these visits to another parent as well as return for subsequent visits (Coker, et al. 2014).

The quality of these visits is highly reliant on high level physicians, limited to the physician decided direction of the visit, and time physician gives to the visit (Coker, et al. 2015).

Another factor to consider in the quality of WCC is role of cultural competence in the very culturally diverse United States. There are significant ethnic disparities in how pediatric primary care is received. In a study that evaluated Chinese and Vietnamese family attitudes and perspectives on WCC they found that adherence to WCC visits were lower in these Asian populations and parents were less likely to describe these visits as comprehensive and culturally sensitive. In describing the quality of these visits half of the Asian parents thought WCC visits were "too simple" and that they did not address concerns or thoroughly evaluate their child's health (Ragavan, et al. 2017). It is important to mention that in the families measured for this study Asian children had the same rate of insurance coverage as their Caucasian counterparts.

It has been identified in other studies that adherence is due to quality of these visits and accessibility of WCC.

Access to Pediatric Primary Care/ WCC

Low-income families are at the greatest amount of risk for lack of healthcare access. It is visible that socioeconomic status is closely correlated with access to WCC and maternal care. The national supplemental nutrition program for Women, Infants, and Children (WIC) provided to low socioeconomic status mothers has been influential in access to WCC and health seeking behaviors. In a study looking at the

influence of WIC on healthcare utilization it was found that mother's enrolled in WIC had infants with shorter hospital stays after birth when compared to non-WIC infants. These mothers were more likely to adhere to WCC visits and meet the American Academy of Pediatrics' guidelines for number of visits and vaccinations (Bersak, et al. 2017).

The Affordable Care Act (ACA) made access to primary and preventive care services more accessible for low-income families of all racial groups. The most profound impact was seen on Hispanic/Latino children where the ACA increased insurance coverage for this group substantially and resulted in increased adherence to WCC and decrease in emergency department utilization (Ortega, et al. 2017). There was a small decrease of the uninsured population among African American families and a substantial decrease of emergency department utilization.

The organization Centering Parenting is a model of group dyad care that offers maternal care and infant care. This model could improve quality, efficiency, and access to healthcare for mothers and infants. By combining pre-natal care with post-partum care mothers learn how to take care of their infant from belly to birth. This model has improved access and utilization of pediatric primary care for low-income families (Connor, et al. 2017).

Developmental Surveillance and Screening

The reason evaluating children from birth to three years of age is of such critical importance is because this is a time of rapid brain development resulting in long-term cognitive, physical, behavioral, and emotional development. Early

detection of developmental and behavioral conditions including intervention is important to child health outcomes. There is also the federal program called Individuals with Disability Education Act (IDEA) that provides free or low cost early intervention services under Part C for Infant and Toddlers less than 2 years of age (King, et al. 2003). This is a publicly available option for families of all income brackets.

It is estimated that 12-16% of children in the United States have developmental and behavioral problems, but only 1.8% of children birth to two years receive early intervention (Hix-Small, et al. 2007). The issue becomes the physician's ability to detect developmental and behavioral problems. The time a physician spends with each pediatric patient only range between 15-30 minutes, which is not viewed as adequate amount of time to conduct screening procedures. A screening tool was created called the Ages and Stages Questionnaire (ASQ), which allows the parent to fill it out prior to office visit, office staff to score the assessment, and pass the score to the physician for evaluation. This screening tool takes parents 12-18 minutes to complete and is available in many different languages. The ASQ is a general development screening tool that evaluates gross motor skills, fine motor skills, problem solving, and communication. The American Academy of Pediatrics (AAP) issued screening algorithms and methods including the use of standardized parent proxy evaluations. Examples of these parent proxy evaluations include: Parental Evaluation of Developmental Status (PEDS), Child Development Inventories (CDI), and ASQ (Singh et al. 2016). The time points in which these developmental screenings are recommended to be done has been debated but the

conclusion of the AAP is recommended standardized screenings at 9 months, 18 months, and 30 months (AAP, 2006). As well as these recommended screenings at specific ages, individual screenings should also be done on an individual basis based on physician and parental concern.

Developmental screening is important to children's overall health outcomes because early detection and intervention can provide parents and children the necessary tools and skills to improve quality of life and improve developmental and behavioral issues.

Pediatric Primary Care/ WCC Improvements for the Future

As mentioned early in this review, group dyad care has proved to be a feasible option for low-income families and could be put in place at Federally Qualified Health Centers (FQHC). This group dyad care has been named Centering Parenting, which provides maternal and infant care, education, and resources. It has broad community possibilities and could increase adherence to WCC (Connor, et al. 2017).

The United States Child and Maternal Health Bureau has recommended better organization of preventive services within primary care practices and better coordination between private practices and community practices (Margolis et al. 2001). In a study done to meet this recommendation intervention groups were set at the community level, private practice level, and family level. The intervention for these mothers began after they sought care at the community health center, then they were enrolled in home visits organized by public and private practices.

Mother's enrolled in the intervention group were more likely to have increased numbers of WCC visits and provide a safe and stimulating home environment for their child (Margolis et al. 2001). While home visits are not achievable for a larger population, the collaboration between private and public practices is an important feature that could have broad implications for future improvements to quality and access to WCC. As well as collaboration there is a movement from physicians to physician assistants and nurse practitioners as a multi-disciplinary team to share the ever-growing responsibilities of primary care practice (Warmels, et al. 2017).

As the findings determined in the study done on WIC and healthcare utilization, empowering families with information provides them with confidence and better health seeking behaviors. This is important in the detection of developmental and behavioral health conditions, because so often they are not caught early due to lack of WCC access or lack of good quality WCC. These children then fall between the cracks and tend to have poor long-term health outcomes because they fall behind in school and feel isolated from social circles. There are low cost programs in place to serve children with these conditions and provide early intervention (King et al. 2003).

Children are the future, so it is of the utmost importance that we provide children and their families with quality healthcare that provides support, tools, and empowerment needed for families to be healthy and happy.

Chapter Three: Manuscript

Examining the Association Between Well Child Care and Developmental and Behavioral Health Conditions in Children

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ABSTRACT

Background: Well child care visits (WCC) are critical preventive care visits that start at infancy. Currently, little is known about the association between WCC and parent report of developmental and behavioral health conditions in children. The purpose of this research was to examine if WCC contributes to developmental/behavioral health conditions reported by parents.

Methods: The 2016 NHIS data were used for this research. Weighted estimates were calculated to assess the relationship between the receipt of WCC (yes or no to receipt in past 12 months) and presence of developmental/behavioral conditions; a Pearson's chi square was used to determine bivariate associations between characteristics and WCC, followed by multivariable logistic regression to adjust for child sex, age, healthcare access of parent, parent education level and parent income level.

Results: Among 2,453 children 3 years and younger 91.04% of these children had received WCC in the past 12 months. The weighted percent of children with any developmental/behavioral conditions was 7.78% in those receiving WCC and 4.62% in children not receiving WCC. Bivariate associations determined that the statistically significant characteristics for receipt of WCC are: the child's race/ethnicity, the number of office visits (a combination of WCC and sick child visits), parent education level, combined family income, and ratio of income to poverty threshold. The logistic regression model evaluating developmental and behavioral conditions adjusted for variables that were statistically significant. The adjusted model found that the number of office visits and parent education level were statistically significant in the detection of developmental and behavioral health conditions.

Conclusion: The number of office visits (which include WCC) are important preventive clinical services for identifying developmental/behavioral conditions in young children. Parent education level is another significant factor that determines receipt of WCC and detection of developmental/behavioral conditions. By understanding the factors associated with WCC, targeted interventions can be developed to increase identification of developmental/behaviors conditions.

Introduction:

The American Academy of Pediatrics currently has the "Recommendations for Preventive Pediatric Care" which lists recommended services every child should receive starting from birth to 21 years of age. (AAP, 2017). It outlines a monthly schedule for infants and a yearly schedule for children and adolescents. The purpose of the AAP recommendations for well child care is to ensure children receive preventative care, monitor proper development, and address parental concerns for children (AAP, 2017). Well Child Care (WCC) has garnered much attention and is recognized as the best-known pediatric preventive care in the United States.

The guidelines outlined in the AAP WCC recommendations represent a standard of care for pediatricians and parents to follow. In the first year of life it is recommended that an infant receive seven pediatric office visits for physical examination, immunizations, developmental assessment, sensory screening, and body measurements (AAP, 2017). These recommendations are created in partnership with Bright Futures, a government funded agency established to support primary care in providing child and adolescent well child care, to ensure that every child has quality care and is being evaluated for more than physical conditions but developmental and behavioral conditions as well.

Currently, in the United States, it is estimated that 12-16% of children have developmental and behavioral problems, but only 1.8% of children birth to two years receive early intervention (Hix-Small, et al. 2007). Given the limited time a

physician can spend during each patient-provider encounter, conducting developmental screening can be difficult. To address this issue the Ages and Stages Questionnaire (ASQ) developmental screening instrument comes in a self-administered form, which allows the parents to fill it out prior to office visit or at the time of office visit. The ASQ takes parents 12-18 minutes to complete and is available in many different languages. The ASQ evaluates gross motor skills, fine motor skills, problem solving, and communication at various ages from birth to three. After the parent completes the ASQ the score is computed by the clinical staff and provided to the physician for review and discussed with parents during patient encounters.

The American Academy of Pediatrics (AAP) issued other screening algorithms and methods including the use of standardized parent proxy evaluations. Examples of these parent proxy evaluations are: Parental Evaluation of Developmental Status (PEDS), Child Development Inventories (CDI), and ASQ (Singh et al. 2016). The time points in which these developmental screenings are to be done have been debated but the conclusion of the AAP is standardized recommended screenings at 9 months, 18 months, and 30 months (AAP, 2006). It is important to mention that developmental screenings differ from developmental surveillance. Developmental surveillance occurs as on-going physician monitoring and documentation of parent concerns over time. If surveillance reveals concerns and it is not a screening visit, it is then recommended that a screener be done. If surveillance and/or screening reveal that a child is at risk for delays, then the child should be referred for further evaluation and early intervention services.

Previous research done on WCC does not evaluate the relationship between parent report of pediatric preventive care and developmental and behavioral conditions. The research question to be addressed is, do parent-report of at least one well child care visit contribute to a greater proportion of parent reported diagnosed developmental and behavioral health conditions? The purpose of this study was to determine the association between parent reports of receiving WCC and parent reports of doctor diagnosis of developmental and behavioral health conditions in young children using the 2016 National Health Interview Survey (NHIS) data.

Methods:

The 2016 National Health Interview Survey was used to conduct this research analysis. This survey is done annually to examine health data among the U.S. population, and is a cross-sectional, multistage probability design, designed to prevent oversampling and weighted to be generalizable across the United States. Exclusion criteria for this survey includes all people who are incarcerated, active military as well as dependents, U.S. citizens living in foreign countries, and individuals living in long-term care facilities. In the 2016 NHIS final merged data set the study sample size was 11,107, which was narrowed down to children three years and younger for a final sample size of 2,453. All data were measured at a significance level of p=0.05.

Definition of Variables:

The 2016 NHIS data includes a direct measure for WCC, which is measured by yes or no to receiving WCC in the past 12 months. The number of office visits to their primary care provider was utilized as well because the dataset defines these visits as a combination of WCC and sick child care. These visits are measured by number of times the child has gone to their primary care physician, 1, 2-3, 4-5, 6-7, and 8 or more. All of the developmental and behavioral health conditions were consolidated into one variable called "Behavior"; if any of the conditions were present then presence would equal yes, and if none of the conditions were present then presence would equal no. This was done due to very small sample sizes of children diagnosed with these conditions.

The child's age was included as birth-11months, 1 year, 2 years, and 3 years old. The race of the child was consolidated into white and non-white due to small sample sizes in non-white racial groups. The parent's ability to access healthcare was included by measuring change of healthcare place in the past 12 months (response was yes or no), delayed healthcare in past 12 months due to long wait in physician's office (response was yes or no), and delayed healthcare in past 12 months due to inability to make physician's office hours (response was yes or no). The parent's highest level of education attained was also assessed in categories of education: 8th grade or less, 9th-12th no diploma earned, GED, high school diploma earned, some college, associate degree of arts at a technical or vocational school, associate of arts at a college or university, bachelor's degree, and master's degree earned. The parent's income level was also assessed looking at income brackets of: 34,999 US dollars or less annually, 74,999-35,000 US dollars annually, 99,999-75,000 US

dollars annually, and 100,000 or more US dollars annually. The ratio of family income to the poverty threshold was also assessed to account for family size regarding income.

Analytic Procedures:

Bivariate analysis was conducted to assess the relationships between WCC and developmental/behavioral conditions, as well as characteristics of the sample population. Descriptive analytics on the data were collected to understand the characteristics of children who receive WCC and of those who do not receive WCC. In answering the initial research question, a Pearson's chi square test for dichotomous outcomes was conducted to evaluate the relationship between presence of WCC and parent report of any developmental and behavioral conditions. Following this analysis, a multivariable logistic regression was run on two models. The unadjusted model evaluated bivariate associations between developmental and behavioral health conditions and each of the predictors. The adjusted model evaluating developmental and behavioral conditions adjusted for all of the predictors: WCC, child's race/ethnicity, the number of office visits to their primary care (which are a combination of WCC and sick child visits), parent education level, combined family income level, and ratio of family income to the poverty threshold.

Results:

It was found that of 2,453 children 3 years and younger 91.01% of these children had received WCC and 8.98% did not receive WCC in the past 12 months.

The weighted percent of children with any developmental/behavioral conditions was 7.78% in those receiving WCC and 4.62% in children not receiving WCC in the past 12 months (Refer to Table 1). Bivariate associations revealed that the statistically significant characteristics for determining whether a child receives WCC are: the child's race/ethnicity, the number of office visits to their primary care (which are a combination of WCC and sick child visits), parent education level, combined family income level, and ratio of family income to the poverty threshold (Refer to Table 1). Bivariate associations also determined that the statistically significant characteristics for determining parent report of developmental/behavioral health conditions in children three years and younger are: child sex and number of office visits received (Refer to Table 2).

The logistic regression model evaluating developmental and behavioral conditions adjusted for these variables that were statistically significant. In the adjusted model it was found that the number of office visits (when 6 or more in the past 12 months) and parent education level (at all levels) were statistically significant in parent report of developmental and behavioral health conditions (Refer to Table 3).

Comments:

The data suggests that more research needs to be conducted on the topic to determine what relationship exists between pediatric preventive care and parent report of developmental/behavioral health conditions by experimental designs.

The proportion of children who have been diagnosed with developmental and behavioral health conditions is much greater in those children who do receive WCC than those who do not. It can be supported that WCC is important for detection of developmental and behavioral health conditions in children. Parent health seeking behaviors tend to be better in parents whose child does receive WCC in the past 12 months with statistically significant higher rates of office visits within this group. Because previous data from other research studies suggest that lower socioeconomic status of the parent plays a role in whether a child receives preventive care; combined family income and ratio of family income to poverty threshold were added to the model to determine the relationship between WCC and income. It was found that family income and ratio of income to the poverty threshold were statistically significant at p= <.0001. This finding supports previous literature that has found an association between parent income and child receipt of preventive care.

Limitations:

The 2016 National Health Interview Survey is cross-sectional, thereby this study is observational and cannot make any casual inferences.

The NHIS is an all-encompassing survey of health that does not focus on developmental/behavioral health conditions or well child care, instead evaluates all aspects of health. Although NHIS is a representative sample, this survey does have exclusion criteria for some subgroups such as: the incarcerated, active military as well as dependents, U.S. citizens living in foreign countries, and individuals living in long-term care facilities, thereby limiting the generalizability to those populations.

The data collected is interview data, and reports for children are by parent-proxy, which is subject to recall bias.

The overall sample size of children with any developmental and behavioral conditions was very small and the office visits evaluated did combine routine care with acute care, which makes it difficult to determine from the survey content how many visits were well child care visits.

The survey did not include any questions for parents regarding whether their child's primary care physician gave them a developmental screener or asked them if they had any concerns about their child in the past 12 months. This would be important to include in future surveys, to know if children are receiving the recommended surveillance and screening. The survey did not explicitly state whether the parent had more than one child and which child the questions were being asked for. The inclusion of parent age and sex as a separate variable in the child section of the data set would improve collection of sociodemographic features in the future.

Conclusion:

The implications of this research suggest that more research is needed to understand what type of interventions should be created to target parents based on educational status and family income to improve receipt of well child care. Empowering families with information could provide them with the confidence needed to develop better health seeking behaviors. This is important in the

detection of developmental and behavioral health conditions, because very often these conditions are not caught early due to lack of information on importance of preventive care and little understanding of these conditions (King et al. 2003).

It is important to reach children with developmental and behavioral conditions before school-age, so they do not fall behind in school or feel isolated from social circles (Mimila, et al. 2017). Early identification of developmental and behavioral conditions by intervention could improve support for families and children, which is important to child health outcomes.

Table 1: Characteristics of Children 3 and Younger with and without WCC

Table 1: Characteristics of Children 3 Years and Younger Receiving and Not Receiving Well Child Care						
Characteristic	Receiving Well Child Care in Past 12 months N=2256 (91.04)			Not Receiving Well Child Care in Past 12 Months N=197 (8.96)		
	Frequency (Weighted %)	95% Confidence Intervals		Frequency (Weighted %)	95% Confidence Inte	P Value
Child Age:						0.1302
Birth - 11 Months	580 (24.62)	22.4171	26.8163	53 (24.23)	16.2851	32.1739
1 year	580 (26.25)	23.8930	28.6100	38 (22.86)	14.6463	31.0782
2 year	570 (24.92)	22.5123	27.3191	41 (19.22)	12.6966	25.736
3 year	526 (24.22)	21.8138	26.6185	65 (33.69)	25.133	42.2509
Child Sex:						0.8793
Male	1179 (50.75)	47.9137	53.4675	100 (49.20)	40.1415	58.2649
Female	1077 (49.25)	46.5325	52.0863	97 (50.79)	41.7351	59.8585
Child Race:						0.0033
White	1668 (72.99)	70.4456	75.5349	134 (62.03)	52.8952	71.1626
Non-White	588 (27.01)	24.4651	29.5544	63 (37.97)	1.4151	28.4095
*ǂ Report of Any Developmental and/or Behavioral Condition:						
Yes	69 (7.78)	5.4861	10.0691	4 (4.82)	1.2431	10.4431	0.4090
No	1027 (92.22)	89.9307	94.5197	102 (95.18)	89.5569	100.00	
*Number of Office Visits in Past 12 months:						<.0001
,1	288 (13.89)	11.8842	15.8902	36 (15.65)	9.5573	21.7460
2,3	757 (35.01)	32.2426	37.5878	58 (27.18)	19.6688	34.7072
4,5	597 (25.37)	22.8818	27.8489	26 (12.35)	7.9011	16.7983
6,7	265 (10.25)	8.6878	11.8078	13 (6.11)	2.5250	9.7035
8 or more	297 (12.78)	11.0691	14.4985	18 (10.25)	4.9495	15.5564
*Change of Healthcare Place in Past 12 months:						0.5753
Yes	188 (7.65)	6.3973	8.9497	12 (6.24)	2.6829	9.8007
No	2025 (92.35)	91.0148	93.5688	162 (93.76)	90.1993	97.3171
Delayed Medical Care Due to Long Wait at Doctor's Office Past 12 months:						0.6350
Yes	74 (3.38)	2.3258	4.4349	8 (5.27)	1.0781	11.7074
No	2182 (96.62)	95.4351	97.5719	188 (94.53)	88.0912	100.00
Delayed Medical Care Due to Doctor's Office Hours Past 12 months:						0.3091
Yes	43 (2.34)	1.3051	3.3662	5 (3.92)	0.3296	7.5128
No	2213 (97.66)	96.5044	98.5921	192 (96.08)	92.4872	99.6704
*Parent Highest Education Level:						<.0001
8th Grade or Less	28(1.61)	0.8858	2.3355	8(4.20)	0.1754	8.427
9-12th, No Diploma	88(5.26)	3.9408	6.5763	18(14.49)	6.9102	22.0659
GED Received	42(1.96)	1.1746	2.7505	5(2.30)	0.1120	5.5384
High School Diplom	343(15.09)	13.2506	16.9371	41(25.35)	16.2221	34.4861
Some College	422(18.46)	16.3858	20.5404	42(20.70)	14.193	27.2131
AA degree, Tech/Vo	187(8.65)	7.0825	10.2145	21(9.71)	5.0728	14.3399
AA degree,Academi	115(4.87)	3.7715	5.9581	9(2.37)	0.6122	4.1365
Bachelor degree	556(23.93)	21.7515	26.1081	25(11.10)	6.4219	15.7813
Master degree	473(20.17)	17.9088	22.4278	27(9.77)	5.8302	13.7181
*Total Combined Family Income (in US dollars):						<.0001
0-34,999	569(28.22)	25.5402	30.8965	74(46.77)	36.8401	56.7053
35,000-74,999	631(30.20)	27.5318	32.8657	60(33.26)	25.0146	41.5099
75,000-99,999	302(13.99)	12.1189	15.851	12(5.92)	1.5839	10.2567
100,000 and over	574(27.60)	25.0345	30.1614	32(14.05)	9.1101	18.9794
*Ratio Family Income to Poverty Threshold						<.0001
Under 0.5	116(6.75)	5.2323	8.2718	16(13.24)	6.8338	19.6433
0.5-0.74	86(5.08)	3.772	6.3811	16(14.58)	6.744	22.4121
0.75-0.99	101(5.91)	4.5727	7.2513	13(10.61)	5.1935	16.0209
1.00-1.24	98(5.83)	4.3799	7.2705	13(7.16)	2.4658	11.8598
1.25-1.49	113(6.70)	5.1789	8.2295	10(7.77)	2.9436	12.5903
1.50-1.74	81(4.18)	3.0836	5.2738	8(4.35)	0.2802	8.4195
1.75-1.99	108(5.68)	4.3279	7.0408	12(6.94)	1.5254	12.3463
2.00-2.49	181(10.17)	8.2514	12.0818	17(9.10)	5.0082	13.1309
2.50-2.99	146(7.49)	6.0483	8.9314	9(3.10)	0.7997	5.4115
3.00-3.49	162(7.22)	5.7804	8.6574	14(9.20)	3.1373	15.2524
3.50-3.99	135(7.52)	5.97	9.077	4(0.944)	0.5221	2.0684
4.00-4.49	99(5.32)	4.0536	6.5938	6(3.60)	1.7133	5.4944
4.50-4.99	92(3.83)	2.958	4.6949	1(0.16)	0.1002	0.4721
5.00 and over	413(18.32)	16.1944	20.4417	20(9.28)	5.5294	13.0395
* Denotes Missing Data Not Presented						
ǂ Denotes Diagnosis by Parent-Proxy						

Table 2: Characteristics of Children 3 Years and Younger ANY Developmental/Behavioral Conditions

Table 2: Characteristics of Children 3 Years and Younger With and Without Any Developmental/Behavioral Conditions					
Characteristic	With ANY Developmental/Behavioral N=73 (7.43)		Without ANY Developmental/Behavioral N=1135(92.57)		
	Frequency (Weighted %)	95% Confidence Intervals	Frequency (Weighted %)	95% Confidence Int	P Value
Child Age:					0.0973
2 year	29(37.12)	26.0609 48.1547	584(50.51)	46.4406 54.5786	
3 year	44(62.89)	51.8453 73.9391	551(49.49)	45.4214 53.5594	
Child Sex:					0.0475
Male	51(66.34)	54.8819 77.7911	588(50.85)	47.1467 54.556	
Female	22(33.66)	22.2089 45.1181	547(49.15)	45.444 52.8533	
Child Race:					0.5611
White	59(74.84)	61.3291 88.3597	804(70.25)	66.5828 73.9128	
Non-White	14(25.16)	11.6403 38.6709	331(29.75)	26.0872 33.4172	
*ǂ Received Well Child Care in Past 12 Months					0.4090
Yes	69(93.84)	88.9795 98.6979	1022(90.13)	87.7395 92.5262	
No	4(6.16)	1.3021 11.0205	102(9.87)	7.4738 12.2605	
*Number of Office Visits in Past 12 months:					<.0001
,1	7(7.44)	1.5245 12.8371	293(27.43)	17.4529 32.5543	
2,3	23(36.67)	23.4162 49.9269	469(41.82)	38.0117 45.6279	
4,5	13(17.20)	9.6914 24.7148	230(19.01)	16.0386 21.9792	
6,7	10(10.09)	3.8658 16.3197	60(4.20)	2.8825 5.5226	
8 or more	20(28.60)	16.5776 40.6165	83(7.54)	5.6609 9.4235	
*Change of Healthcare Place in Past 12 months:					0.6603
Yes	8(9.49)	2.5173 16.4686	98(7.70)	5.9754 9.4302	
No	64(90.51)	83.5314 97.4827	1001(92.29)	90.5698 94.0246	
Delayed Medical Care Due to Long Wait at Doctor's Office Past 12 months:					
Yes	4(5.22)	1.3241 12.485	43(3.63)	2.2304 5.0218	
No	69(94.78)	87.515 98.546	1092(96.37)	94.503 97.3857	
Delayed Medical Care Due to Doctor's Office Hours Past 12 months:					
Yes	7(11.51)	0.8711 22.1562	25(3.02)	1.4094 4.6364	
No	66(88.49)	77.8438 99.1289	1110(96.98)	94.8924 98.2027	
*Parent Highest Education Level:					0.8789
12th or less, No Dip	2(4.45)	3.4189 5.4798	66(7.26)	3.3181 7.4231	
GED Received	1(2.45)	1.4344 6.4817	26(2.24)	1.1371 3.3475	
High School Diplom	12(16.75)	6.2829 27.222	166(14.81)	12.1693 17.4592	
Some College	22(27.56)	17.1060 38.0043	205(18.43)	15.5563 21.3029	
AA degree, Tech/Vo	5(6.34)	4.2210 12.9366	93(8.56)	6.5288 10.5819	
AA degree,Academi	4(6.37)	3.8699 13.4044	66(5.41)	3.8744 6.9503	
Bachelor degree	14(21.10)	9.7983 32.4096	275(23.43)	20.3866 26.4708	
Master degree	13(15.28)	5.4181 25.1508	237(19.85)	16.6303 23.0767	
*Total Combined Family Income (in US dollars):					0.2556
0-34,999	29(42.07)	32.4392 51.7059	305(30.08)	26.2212 33.9292	
35,000-74,999	23(28.82)	17.9684 41.6721	301(28.90)	25.2210 32.5689	
75,000-99,999	5(5.60)	3.3320 11.8339	159(13.82)	11.2901 16.3529	
100,000 and over	11(22.50)	12.3415 32.6653	292(27.22)	23.5364 30.8804	
*Ratio Family Income to Poverty Threshold					0.4508
Under 0.5	6(13.38)	8.7089 18.0497	70(8.22)	5.9118 10.5233	
0.5-0.74	5(6.78)	2.2515 11.3103	45(5.08)	3.1600 6.9897	
0.75-0.99	6(10.01)	1.8176 18.2105	56(6.64)	4.6733 8.6008	
1.00-1.24	2(3.63)	1.6082 5.6449	44(5.32)	3.4110 7.2364	
1.25-1.49	5(8.00)	3.6654 16.7805	53(5.99)	3.6764 8.3021	
1.50-1.74	5(2.54)	0.4112 4.6768	45(4.34)	2.8421 5.8445	
1.75-1.99	6(7.27)	4.4340 10.1133	52(4.97)	3.3111 6.6364	
2.00-2.49	6(8.11)	3.7712 16.3914	91(10.41)	7.7616 13.0575	
2.50-2.99	6(9.56)	0.3913 18.7192	70(6.70)	4.7884 8.6174	
3.00-3.49	1(3.18)	0.8999 9.7963	92(8.60)	6.4444 10.7506	
3.50-3.99	6(15.99)	8.8069 23.1644	68(7.43)	5.1241 9.7428	
4.00-4.49	3(2.33)	1.4178 3.2399	54(5.64)	3.8247 7.4611	
4.50-4.99	2(2.04)	0.5443 5.1936	47(3.88)	2.5311 5.237	
5.00 and over	5(7.18)	3.1014 14.5609	198(16.77)	13.8169 19.7236	
* Denotes Missing Data Not Presented					
ǂ Denotes Diagnosis by Parent-Proxy					

Table 3: Logistic Regression Models for Developmental/Behavioral Conditions

Table 4: Adjusted and Unadjusted Logistic Regression Models for Developmental/Behavioral Conditior				
	Unadjusted Model		Adjusted Model	
Predictors:	OR (95% CI)	P value	OR (95% CI)	P value
Well Child Care in Past 12 months:				
Yes	1.666(0.487,5.701)	0.4162	1.448(0.294,7.129)	0.7471
No	Reference		Reference	
Child Sex:				
Male	Reference		Reference	
Female	0.525(0.272,1.013)	0.0548	0.550(0.275,1.100)	0.1432
Child Age:				
0-3 Years	1.730(0.910,3.288)	0.0944	1.482(0.768,2.861)	0.3884
Child Race:				
White	Reference		Reference	
Non-White	0.794(0.366,1.722)	0.5583	0.566(0.244,1.311)	0.1227
Change of Healthcare in Past 12 months:				
Yes	1.257(0.458,3.453)	0.6571	1.177(0.419,3.308)	0.5674
No	Reference		Reference	
Number of Office Visits In Past 12 months:				
,1	Reference		Reference	
2,3	2.504(0.916,6.843)	0.4001	1.797(0.572,5.640)	0.6755
4,5	2.584(0.851,7.849)	0.4256	2.707(0.819 8.951)	0.4981
6,7	6.857(2.094,22.457)	0.0021	7.071(1.854,26.972)	0.0046
8 or more	10.826(3.705,31.637)	<.0001	13.990(4.010,48.814)	<.0001
Parent Highest Education Level:				
8th Grade or Less	<0.001(<0.001,<0.001	<.0001	<0.001(<0.001,<0.001	<.0001
9-12th, No Diploma	1.076(0.142,8.160)	0.2143	1.753(1.112,24.068)	0.0061
GED Received	1.244(0.141,11.01)	0.1939	<0.001(<0.001,<0.001	<.0001
High School Diploma	1.469(1.366,4.533)	0.0008	1.479(1.291,6.743)	<.0001
Some College	1.942(1.281,5.152)	<.0001	1.862(1.531,6.735)	<.0001
AA degree, Tech/Voc	0.962(0.244,3.795)	0.0781	1.951(1.274,3.561)	<.0001
AA degree,Academic	1.529(1.388,6.358)	0.0126	1.139(1.288,5.445)	0.0006
Bachelor degree	1.77(1.421,3.720)	0.0011	1.688(1.579,4.833)	<.0001
Master degree	Reference		Reference	
Total Combined Family Income (in US dollars):				
0-34,999	1.691(0.681,4.204)	0.0555	1.989(0.525,7.533)	0.3204
35,000-74,999	1.248(0.488,3.194)	0.4531	1.449(0.430,4.885)	0.6677
75,000-99,999	0.490(0.281,2.017)	0.1257	0.430(0.081,2.289)	0.0641
100,000 and over	Reference		Reference	
Ratio Family Income to Poverty Threshold				
Under 0.5	3.802(0.751,19.259)	0.2878	4.337(0.328,57.324)	0.3828
0.5-0.74	3.120(0.678,14.360)	0.4239	1.991(0.165,24.093)	0.9484
0.75-0.99	3.523(0.744,16.696)	0.3146	1.679(0.155,18.227)	0.7600
1.00-1.24	1.591(0.220,11.529)	0.7258	0.993(0.079,12.497)	0.3729
1.25-1.49	3.118(0.566,17.186)	0.5171	3.523(0.385,32.211)	0.3686
1.50-1.74	1.368(0.288,6.506)	0.4185	1.322(0.164,10.677)	0.4752
1.75-1.99	3.415(0.774,15.071)	0.3004	2.583(0.301,22.134)	0.7586
2.00-2.49	1.819(0.394,8.400)	0.7784	2.571(0.339,19.479)	0.7283
2.50-2.99	3.329(0.656,16.903)	0.4112	4.950(0.780,31.418)	0.1468
3.00-3.49	0.864(0.083,9.010)	0.3569	1.134(0.072,17.882)	0.5097
3.50-3.99	5.022(1.053,23.948)	0.0945	6.239(1.207,32.240)	0.0725
4.00-4.49	0.964(0.166,5.585)	0.2318	1.714(0.248,11.869)	0.8051
4.50-4.99	1.229(0.190,7.969)	0.4583	1.183(0.160,8.743)	0.5427
5.00 and over	Reference			

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