Spring 2017

The Association between Socioeconomic Status and Children's Overall Health: The Important Role of Type I Diabetes Mellitus

Sona Seligova
Sona.Seligova@Colorado.EDU

Follow this and additional works at: https://scholar.colorado.edu/honr_theses

Part of the Community-Based Research Commons, Family, Life Course, and Society Commons, Health and Medical Administration Commons, and the Medicine and Health Commons

Recommended Citation
Seligova, Sona, "The Association between Socioeconomic Status and Children's Overall Health: The Important Role of Type I Diabetes Mellitus" (2017). Undergraduate Honors Theses. 1443.
https://scholar.colorado.edu/honr_theses/1443

This Thesis is brought to you for free and open access by Honors Program at CU Scholar. It has been accepted for inclusion in Undergraduate Honors Theses by an authorized administrator of CU Scholar. For more information, please contact cuscholaradmin@colorado.edu.
The Association between Socioeconomic Status and Children’s Overall Health: The Important Role of Type I Diabetes Mellitus

A Systematic Review and a Quantitative Analysis of a National Survey

Soňa Seligova

Department of Sociology,
University of Colorado at Boulder

Defense Date: April 3, 2017

Thesis Advisor:
Dr. Ryan Masters, Department of Sociology

Defense Committee:
Dr. Matthew Brown, Department of Sociology
Dr. Ryan Masters, Department of Sociology
Dr. Carol Conzelman, Department of Anthropology
Abstract

Type I Diabetes Mellitus is a chronic illness that affects children nationwide. Chronic diseases like diabetes can affect well-being as well as physical health. The primary focus of this paper is to examine how social determinants of health such as education and income are associated with children’s overall health, and how this association is affected by childhood diabetes. I used the National Survey of Children’s Health (NSCH), representative national-level data, to analyze this association. A series of cross-tabulations and three-way associations were conducted to test for the significant influences of diabetes on socioeconomic status and health. While diabetes suppressed the relationship between socioeconomic status and health, overall a strong association was found between social determinants and health in the sample. These important findings contribute to our understanding of how key social determinants of health such as socioeconomic status can be shaped by childhood chronic conditions such as diabetes.

Keywords: overall health, childhood diabetes, survey data, NSCH, Fundamental Cause theory, socioeconomic status
Introduction

For the purpose of this research, the association between social determinants and overall health were examined. Further, the differences between families with children who had Type 1 Diabetes and families with children that did not have a chronic illness were investigated. According to the Centers for Disease Control and Prevention (CDC), 1.25 million Americans have Type 1 Diabetes, with 200,000 of them being less than 20 years old (CDC 2017). Unlike Type 2 Diabetes, where the body cannot use the insulin it already has, Type I Diabetes is when the body does not make enough insulin. Type 2 Diabetes is usually seen in adults, and Type 1 can develop at any age.

The onset of Type 1 Diabetes begins with the body mistakenly destroying the insulin-producing (islet) cells in the pancreas. (Mayo Clinic 2017). After this occurs, the body is unable to produce the insulin it needs to regulate blood glucose levels. While the primary cause of Type I Diabetes is said to be genetic, research is still being done into what causes Type 1 Diabetes to initiate. In a regular system, eating gives the pancreas a signal to secrete insulin into the bloodstream. In turn, “insulin lowers the amount of sugar in the bloodstream and as the blood sugar level drops, so does the secretion of insulin from the pancreas” (JDRF). When there hasn’t been any food in the system for a while, the liver releases glycogen, which is converted into glucose to also regulate blood glucose. In Type 1 Diabetes, this regulation of blood glucose doesn’t occur since there is little to no insulin providing regulation of glucose into the cells. Sugar thus builds up in the bloodstream, which is extremely dangerous on the body (Blackman et al. 2014). Due to these physiological factors influencing the body, children with diabetes are more
vulnerable to certain comorbidities and poorer health.

There is a small amount of literature that examines how Type 1 Diabetes specifically affects overall quality of health. A study looking into the long-term effects of Type 1 Diabetes found that a “small number of largely cross-sectional studies have indicated that diabetes complications are more strongly and consistently associated with lower quality of life” (Jacobson et al. 2013). There is generalizability associated with most literature looking into overall quality of life and type 1 diabetes patients, making it critical to examine the social implications that can affect children with these types of chronic conditions. Not only are there physical consequences of being a type 1 diabetic, but there are also social determinants that challenge the relationship between helpful social standings and overall health.

Children are dependent on their parents especially at younger ages, creating less possibility of taking care of their chronic illness by themselves. Parents thus play a critical role in obtaining the proper health-care that these children need. Chronic illnesses lead to other disadvantageous that have a larger affect than just the chronic illness itself. A diagnosis of a chronic physical health condition puts children at higher risk of maltreatment at any age (Jaudes and Mackay-Bilaver 2008). Children are more likely to be ill-treated based on their health-care needs in the household, but also in social situations. “When children have special health care needs, parents assume the roles of care coordinator, medical expert, and systems advocate as well as their typical parenting roles” (Kratz et al. 2009:303). Parents might not have the proper medical expertise, capacity, or access to adequate health-care for their child, making it difficult to fully
uncover the relationship of overall health considering just the chronic illness itself. Childhood chronic illness and its influence on overall health status is situational upon the education, socioeconomic status, access to care, and other social factors determined by parents.

Due to the unexpected onset of Type I Diabetes Mellitus, it is important to look at the social factors influencing health when analyzing the impacts of this and other types of chronic conditions. The Fundamental Cause Theory (FCT) has seriously considered the relationships between social determinants and overall health, but has not introduced chronic conditions into the theory. This research contributes by combining life-course perspectives and FCT to examine how a chronic condition that begins early in life can influence the relationship between social determinants and overall health. This study reports on the National Survey on Children’s Health (NSCH). The study provides a review of past literature on social determinants influencing health, the quantitative analysis used to provide the research, results found within the NSCH survey, and a closing discussion with potential future research developments.

Theoretical Frameworks

Studies have been conducted to explain the relationships between socioeconomic status (SES) and diseases and how they have continued even with the advancement of medical research and technology (Link and Phelan 1995). The Fundamental Cause Theory, originally developed by Link and Phelan in 1995, understands health as heavily influenced by the social sphere. In this theory, health is persistently associated with social factors such as income, access to resources, and human knowledge. Having flexibility in
the resources people have to acquire a better overall health plays an important role in SES inequalities. As explained by Phelan et. al., “if the problem is heart disease, a person with greater resources is better able to maintain a heart-healthy lifestyle and get the best medical treatment available” (Link and Phelan 1995). This case is analogous with type 1 diabetes, which is a common chronic condition as well. If resources are not available for an individual with type 1 diabetes to get the proper care they may need, their health in turn suffers.

Children with Type I Diabetes are thus more susceptible to changes in their health based on their parents’ socioeconomic status and other social factors. The illness itself poses such challenges that the protective effects of socioeconomic status are seen as less of a factor. This is perhaps more so the case for children, as adults are able to more freely make decisions that impact their health. While poverty may impede these decisions, children are considered to be out of control of their health decisions. Graham and Power (2004) performed a study looking into life-course research and socio-economic disadvantage. The study found that conditions that children are living in are framing their future, making childhood disadvantage a fundamental starting point of future problems. Discussion of the life course are integral to understanding fundamental cause and socioeconomic status. While a person’s socioeconomic status may fluctuate as they age, the long arm of childhood provides the understandings that these inequalities actually begin very early in life (Hayward and Gorman 2004). Life course research thus provides a perspective for understanding how socioeconomic status can shape health trajectories. According to a study done by Ye Luo and Linda J. Waite (2005), all childhood SES
variables are significantly associated with childhood health, with family financial well-being and adult education, and adult income being statistically significant (Luo et al.).

Type 1 diabetes is just one of many chronic diseases that affect American youth. Chronic illnesses within a population are important to delve into due to the fact that they are not necessarily directly causing social issues (poverty, access to health-care, etc.) that are considered malleable. Since chronic conditions can occur at any point in a person’s lifetime, they can act as a control when looking at how social determinants may affect a population overall. It is important to reiterate that chronic diseases have an affect on not only the child’s well-being, but the family members’ well-being who have a relationship with the child (Burton, Lethbridge and Phipps 2008). In a study done on impaired health-quality of children with chronic conditions “patients and parents across the disease clusters reported significantly lower overall psychosocial health in comparison to healthy children and their parents” (Varni, Limbers and Burwinkle 2007:6). The literature suggests that chronic conditions have a negative effect on the overall health of both the child with the disease and their relatives that are closest to them.

Physiological conditions can already cause turmoil within a household, but adding social stress becomes yet another concern for parents with children with chronic diseases. Social stress theory and family resilience are both narratives that factor prominently in the literature, because “a family’s ability to be resilient in the face of normative or significant risk is related not only to their internal relational processes but also to risks or opportunities in the social systems in their ecological context” (Patterson 2002:359). Parents are associated with their children and by default will likely need to spend more
time and money specifically on the child who has the chronic illness which increases risk of further anxiety and stress (Burton, Lethbridge and Phipps 2008). Further looking into the impacts of childhood SES, poor health in childhood, and being disadvantaged early on in life plays as an influencing factor in later life on health conditions and social stress (Haas 2008). Parental strain can thus play a vital role in the outcomes of childhood health when relating to their socioeconomic status.

Education and overall health has been an association that has been consistently seen and in all historical and global contexts. Providing proper health advocacy early on in childhood may facilitate the importance of health, especially in those who are chronically ill. It is pertinent to understand that “center-based care is associated with less soda consumption, more fruit consumption, and more screening for attention deficit disorder, while participation in Head Start is associated with increased screening for attention deficit disorder, hearing problems, and vision problems” (Belfield and Kelly 2013:322). Monitoring and educating parents on children’s health early on will provide better understanding of positive health implications that promote healthier lifestyles and in turn make it easier to adequately navigate the stressors that come with an unexpected health diagnosis like type 1 diabetes.

**Analytic Strategy**

**Data**

The data used is from the National Survey of Children’s Health, with data collected in 2007, 2011, and 2012. The survey conducted was a random sample, and administered via telephone nationwide. Households with children were included and one
child was randomly selected to be the subject of the interview. There were approximately 1,800 interviews collected per state for the 2007 NSCH, and approximately 1,850 interviews collected for the 2011/2012 NSCH. The parents were asked a series of questions about their children and their health. Overall, 156,986 children were included once all the waves were merged from the 3 NSCH survey studies. The age of child was balanced evenly between the three subgroups of 0-5 years, 6-11 years, and 12-17 years. This data was chosen because of its focus on children. The NSCH data was selected to conduct this research because it provided questions that were pertaining to this topic. Mainly, questions about education of parent, parental strain, income, and diabetes were asked about the survey child and their family. Researchers interested in greater details about the NSCH study can find information at the study’s website: https://www.childhealthdata.org/

The key dependent variables for this quantitative study were overall health and parental strain. Income, and parental education were independent variables, with diabetes being controlled for some of the comparative analyses. For the intents of this study, parental education and income were chosen as key indicators because of their theoretical significance in operationalizing SES.

Methods

In order to expand the sample to a sizable population, 3 waves of the NSCH data from 2007, 2011, and 2012 were merged and cleaned. The key variables from each wave were standardized, while all superfluous variables were excluded. From each sample, the variables that were used for the study were coded into specific titles in order to be merged
correctly. The variables were collapsed into 3 categories for each one, to make analyzing the sample simpler and easy to understand. All missing values or answers that were not answered within the 3 categories were coded to be missing and not used for the overall analysis. The latest version of SPSS was used to analyze all data.

The age of the child (in 3 categories) was coded from being “age3_11” for the 2011/12 sample and age “3_07” for the 2007 sample to simply the variable “age” with “1” = 0-5 years old “2” = 6-11 years old “3” = 12-17 years old. Parental strain was named “K8Q30” in both the 2007 and 2011/12 surveys, with the survey question being: “In general, how well do you feel you are coping with the day to day demands of [parenthood / raising children]?” The possible answers were: “1 = very well 2 = somewhat well 3 = not very well 4 – not well at all 6 = don’t know 7 = refused.” These were then coded to the variable name “p_strain” with values changed to: “0 = 1 and 2 (no parental strain); 1 = 3 and 4 (yes to parental strain). The missing values were represented with “.” to exemplify the original surveys answers of “don’t know” and “refused.”

The overall health variable was originally “K2Q01” and was changed to “health_cat”. The question asked for the survey was: “in general, how would you describe [S.C.’s health?]” Answers were: “1- excellent 2 – very good 3-good 4-fair 5-poor 6-don’t know 7-refused”. These were then changed to 3 categories, with “1= 1 and 2 (excellent/very good); 2=3 (good) 3= 4 and 5 (fair/poor)” The missing values were again represented with “.” to represent the answers of “don’t know” and “refused” from the original survey.

Education had to be coded differently for the 2007 sample. For education, if there
were two parents in the household, parents’ overall education was merged to one variable in order to provide only one variable for education. This was done since overall parental education was used as a critical variable for the analysis. The names for education in the 2007 data were: “EDUC_MOMR AND EDUC_DADR.” The questions asked for these variables were “What is the highest grade or year of school [you have / [S.C.’s [MOTHER TYPE] has] completed?” and “What is the highest grade or year of school [you have / [S.C.’s [FATHER TYPE] has] completed?” For 2011/12, education was already based on highest education of either parent, with the name of the variable being: “EDUC_PARR.” The question asked for this variable was: “What was the highest grade or year of school completed by your mother, father, or main guardian?” The answers possible for all of these were: “1: “less than high school” 2 = “high school graduate” 3- “more than high school” 6 = “don’t know” 7 = “refused.” The variable was coded to be “p Educ” and the answers were coded to 3 categories. These categories were “1 = 1 (“less than high school” 2 = 2 (“high school graduate”) 3 = 3 (“more than high school”) and . = 6/7 (missing values).”

For the data sets, poverty was measured as the name “POVERTY_LEVELR” with the poverty level of the household being based on DHHS poverty guidelines (8 categories). These categories were: “1 = “at or below 100% of poverty” 2 = “above 100% to at or below 133% of poverty level” 3 = “above 133% to at or below 150% of poverty level” 4 = “above 150% to at or below 185% of poverty level” 5 = “above 185% to at or below 200% of poverty level” 6 = “above 200% to at or below 300% of poverty level” 7 = “Above 300% to at or below 400% of poverty level” 8 = “Above 400% poverty level.”
The name was coded to be “ses_poverty” and the 8 groups were changed to “1 = 1 (at or below 100% of poverty) 2 = 2/5 (above 100% - at or below 200% of poverty level) 3 = 6/8 (200% and above poverty level) and . = .”

Finally, diabetes for the data sets was coded under “K2Q41A” The question asked was: “Has a doctor or other health care provider every told you that [S.C.] had diabetes?” With the answers being straightforward: “0 = no 1 = yes 6 = don’t know 7 = refused.” These were then coded under the name “sc_diabetes” with the variables changed to: “0 = 0 (“no”) 1 = 1 (“Yes”) and . = 6/7.” It is assumed that diabetes was mostly reported as being type 1 diabetes because the onset of type 2 diabetes doesn’t happen until later on in life, making type 1 diabetes a more juvenile chronic condition. The proportion of Type 2 diabetes has been increasing, with new studies revealing higher levels of type 2 diabetes in children. Researchers from the SEARCH for Diabetes in Youth found that type 2 diabetes in 10-19 year olds has increased 21 percent between the years 2001 and 2009 (Gebel 2012). Although this is a significant amount, it is important to consider that most children diagnosed have type 1 diabetes, making this study more relevant to chronic conditions like type 1 diabetes. All of the selected coded variables were then all merged into a final sample on SPSS called “overallsample.sps.”

The final sample included 156,986 children. After descriptive statistics were collected, both two way and three way analyses were employed to test for statistical significance of the associations. Readers may find the code used in the supplementary appendix.
Results

Table 1 provides the descriptive statistics of the variables included in the research study. Children ages 0-17 were included since the data suggests an even distribution among the 3 groups of ages (see Table 1). Most of the sample reported “very good” or “excellent health”, as well as no parental strain. Thus most children included in the sample were considered healthy by their parents and only rarely did parents report strain (i.e. 1.4%). The analyses used for this research concern rare outcomes and rare predictors. This research is thus focusing more on the marginalized groups, with only 2.2% having poor/fair health, 1.4% having parental strain, and only 0.5% having childhood diabetes. Only 11% of the respondents were in poverty, with only 5.5% having less than a high school education. These disadvantaged positions were still considered to drive the adverse outcomes versus higher education and higher income leading to good outcomes.
### Table 1: Descriptive Statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age of Child</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-5 years</td>
<td>48154</td>
<td>30.7%</td>
</tr>
<tr>
<td>6-11 years</td>
<td>47644</td>
<td>30.3%</td>
</tr>
<tr>
<td>12-17 years</td>
<td>61188</td>
<td>39.0%</td>
</tr>
<tr>
<td><strong>Diabetes</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>156270</td>
<td>99.5%</td>
</tr>
<tr>
<td>Yes</td>
<td>716</td>
<td>0.50%</td>
</tr>
<tr>
<td><strong>Overall Health</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Excellent/Very Good</td>
<td>139296</td>
<td>88.7%</td>
</tr>
<tr>
<td>Good</td>
<td>14230</td>
<td>9.1%</td>
</tr>
<tr>
<td>Fair/Poor</td>
<td>3460</td>
<td>2.2%</td>
</tr>
<tr>
<td><strong>Parental Strain</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>154786</td>
<td>98.6%</td>
</tr>
<tr>
<td>Yes</td>
<td>2200</td>
<td>1.4%</td>
</tr>
<tr>
<td><strong>Poverty Level</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At or below poverty line</td>
<td>16932</td>
<td>10.8%</td>
</tr>
<tr>
<td>101-399% above poverty line</td>
<td>25696</td>
<td>16.4%</td>
</tr>
<tr>
<td>400%+ above poverty line</td>
<td>114358</td>
<td>72.8%</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Below high school degree</td>
<td>8694</td>
<td>5.5%</td>
</tr>
<tr>
<td>High school degree to some college</td>
<td>24002</td>
<td>15.3%</td>
</tr>
<tr>
<td>College degree or above</td>
<td>124290</td>
<td>79.2%</td>
</tr>
<tr>
<td><strong>Total Sample</strong></td>
<td>156986</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

### Two-Way Associations

A series of cross-tabulation analyses were used to compare and test differences in the distribution of diabetes diagnoses by key covariates (i.e. age, socioeconomic status, etc.). Table 2 demonstrates a strong age gradient in diabetes prevalence, with risk of diabetes highest at older ages. In cases per 100,000, 128.8 of children ages 0-5 had diabetes, versus 751.8 of children 12-17 had diabetes. The age distribution among
children without diabetes is roughly equal (Table 2). 30.8% of children were 0-5 years old, 30.4% were 6-11 years old, and 38.9% 12-17 years old. On the other hand, 8.7% of children with diabetes were 0-5 years, 27.1% were 6-11 years, and 64.2% were 12-17 years old. This shows again that the distribution of age was equal among children who did not have diabetes, but was highly concentrated at higher ages for children with diabetes. This data thus has a higher age distribution for analyses that associate diabetes with other social determinants. Poverty, education, and other social factors would play a major role in these children due to the fact that they don’t have much control over their health outcomes.

In terms of overall health for children without diabetes, 88.9% of parents reported their children having excellent/very good health (see Table 3). Only 2.1% of parents reported their children having fair/poor health. Children with diabetes, however, had parental-rated child health at levels of 45.3% of excellent/very good health of their children, and 25.1% fair/poor health. Overall health ratings were more evenly distributed among children with diabetes, showing more than half of the survey children had either good or fair/poor health, compared to the 11.1% of children without diabetes reporting either good or fair/poor health. Children with diabetes were at a higher risk of being in fair/poor health compared to children without diabetes.

Parental strain was not a significant measure due to the low amount of respondents in the subset. Only 2,200 parents reported having parental strain overall, and 22 of those respondents were with children who had diabetes (see Table 4). 98.6% of parents reported no parental strain with children without diabetes, while only 1.4% had
parental strain. 96.9% of respondents reported no parental strain with children who had diabetes, and only 3.1% reported they did have parental strain with children who had diabetes. This suggests that parental strain may be more prevalent with parents whose kids have diabetes, but significance cannot be assumed due to the low number of respondents.

Poverty levels between parents with children with and without diabetes were mostly consistent over the three levels of income (Table 1). For parents with children who do not have diabetes, 72.9% were 400%+ above the poverty line, with 10.9% being at or below the poverty line. For parents with children who have diabetes, 65.9% of respondents reported being 400%+ above the poverty line, with 12.0% being at or below the poverty line. Although there were more parents who had lower education with children who had diabetes, the numbers were consistent between the two subgroups (see Table 5 for more information).

Similarly, the distribution was also consistent when looking at education versus diabetes. According to the data, 5.5% of respondents reported having below a high school degree in terms of education with children who did not have diabetes, and 79.2% reported having a college degree or above. For children with diabetes, 7.0% parents reported having less than a high school degree, with 72.3% reported having a college degree or above (see Table 6 for more information).
Table 2: Age Specific Prevalence of Diabetes

<table>
<thead>
<tr>
<th>Cases per 100,000</th>
<th>0-5 years</th>
<th>6-11 years</th>
<th>12-17 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-5 years</td>
<td>128.8</td>
<td>407.2</td>
<td>751.8</td>
</tr>
</tbody>
</table>

Table 3: Age Distribution by Diabetes

<table>
<thead>
<tr>
<th>Age of Child</th>
<th>Diabetes: No</th>
<th>Diabetes: Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-5 years</td>
<td>48092</td>
<td>62</td>
</tr>
<tr>
<td>6-11 years</td>
<td>47450</td>
<td>194</td>
</tr>
<tr>
<td>12-17 years</td>
<td>60728</td>
<td>460</td>
</tr>
<tr>
<td>Total</td>
<td>156270</td>
<td>716</td>
</tr>
</tbody>
</table>

Table 4: Overall Health by Diabetes

<table>
<thead>
<tr>
<th>Overall Health</th>
<th>Diabetes: No</th>
<th>Diabetes: Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent/Very Good</td>
<td>138972</td>
<td>324</td>
</tr>
<tr>
<td>Good</td>
<td>14018</td>
<td>212</td>
</tr>
<tr>
<td>Fair/Poor</td>
<td>3280</td>
<td>180</td>
</tr>
<tr>
<td>Total</td>
<td>156270</td>
<td>716</td>
</tr>
</tbody>
</table>
Table 5: Parental Strain by Diabetes

<table>
<thead>
<tr>
<th>Parental Strain</th>
<th>Diabetes: No</th>
<th>Diabetes: Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>154092</td>
<td>694</td>
</tr>
<tr>
<td>Yes</td>
<td>2178</td>
<td>22</td>
</tr>
<tr>
<td>Total</td>
<td>156270</td>
<td>716</td>
</tr>
</tbody>
</table>

Table 6: Poverty Level by Diabetes

<table>
<thead>
<tr>
<th>Poverty Level</th>
<th>Diabetes: No</th>
<th>Diabetes: Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>At or below poverty line</td>
<td>16846</td>
<td>86</td>
</tr>
<tr>
<td>101%-399% above poverty line</td>
<td>25538</td>
<td>158</td>
</tr>
<tr>
<td>400%+ above poverty line</td>
<td>113886</td>
<td>472</td>
</tr>
<tr>
<td>Total</td>
<td>156270</td>
<td>716</td>
</tr>
</tbody>
</table>

Table 7: Education by Diabetes

<table>
<thead>
<tr>
<th>Highest Education of Either Parent</th>
<th>Diabetes: No</th>
<th>Diabetes: Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below high school degree</td>
<td>8644</td>
<td>50</td>
</tr>
<tr>
<td>High school degree to some college</td>
<td>23854</td>
<td>148</td>
</tr>
<tr>
<td>College degree or above</td>
<td>123772</td>
<td>518</td>
</tr>
<tr>
<td>Total</td>
<td>156270</td>
<td>716</td>
</tr>
</tbody>
</table>
**Income and Education Association with Health:**

Table 7 shows the associations between socioeconomic status and children’s health. The chi-square statistic between income and overall health is 8169.332, with degrees of freedom (df) equaling 4 indicates that the differences are statistically significant. Among parents who report being at or below the poverty line in terms of income, 7.2% report poor/fair health, whereas 1.2% of parents who report being 400%+ above the poverty line only report poor/fair health. This means parents who are at or below the poverty line are 6 times more likely to report poor/fair health of their child. Education also affected health significantly, especially at the low income level.

For education versus health, the chi-square statistic was 7647.599 with degrees of freedom equaling 2, indicating statistically significant associations. Among parents whose education level is below a high school degree, 9.0% report poor/fair health, whereas parents with a college degree or above only report 1.4% poor/fair health. This means that parents with low education are 6.43 times more likely to report poor/fair health of their child than parents with a higher education. Results show significant associations between parental income and education with children’s overall health status.

**Income and Education Association with Parental Strain:**

Table 8 provides the cross-tabulations showing how income and education both affect parental strain. Parental strain was a variable analyzed to uncover the relationship on income and education on health. The chi-square value of 897.241 was reported between poverty level vs. parental strain, with a degrees of freedom equaling 2. Among parents who report being at or below the poverty the poverty line, 3.6% of people report
parental strain, whereas parents 400% or above the poverty line only report 0.9% parental strain. This means that parents who are at or below the poverty line are 4 times more likely to report parental strain. Parental strain was also affected by the education level of parents, specifically those whose education was less than a high school degree.

The highest education of either parent compared to parental strain proved to have significance. The chi-square value was 1135.141 for education vs. parental strain, with the degrees of freedom equaling 2. Among parents whose education level is below a high school degree, 5.4% report parental strain, whereas parents with a college degree or above only report 1.0% fair/poor health. This means that parents with low education are 5.4 times more likely to report parental strain of their child than parents with a higher education. Low levels of socioeconomic status significantly affect the likelihood of parental strain.
Table 8: Income and Education Association with Health

<table>
<thead>
<tr>
<th>Parental Rated Health – All Respondents</th>
<th>At or below poverty line</th>
<th>101%-399% above poverty line</th>
<th>400%+ above poverty line</th>
<th>Below high school degree</th>
<th>High school degree to some college</th>
<th>College degree or above</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent/Very Good</td>
<td>71.2%</td>
<td>82.7%</td>
<td>92.7%</td>
<td>65.4%</td>
<td>81.0%</td>
<td>91.9%</td>
</tr>
<tr>
<td>Good</td>
<td>21.6%</td>
<td>14.0%</td>
<td>6.1%</td>
<td>25.6%</td>
<td>15.3%</td>
<td>6.7%</td>
</tr>
<tr>
<td>Fair/Poor</td>
<td>7.2%</td>
<td>3.3%</td>
<td>1.2%</td>
<td>9.0%</td>
<td>3.7%</td>
<td>1.4%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>
Table 9: Income and Education Association with Parental Strain

<table>
<thead>
<tr>
<th>Parental Strain – All Respondents</th>
<th>At or below poverty line</th>
<th>101%-399% above poverty line</th>
<th>400%+ above poverty line</th>
<th>Below high school degree</th>
<th>High school degree to some college</th>
<th>College degree or above</th>
</tr>
</thead>
<tbody>
<tr>
<td>No parental strain</td>
<td>96.4%</td>
<td>97.9%</td>
<td>99.1%</td>
<td>94.6%</td>
<td>98.2%</td>
<td>98.6%</td>
</tr>
<tr>
<td>Parental strain</td>
<td>3.6%</td>
<td>2.1%</td>
<td>0.9%</td>
<td>5.4%</td>
<td>1.8%</td>
<td>1.0%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Three-Way Associations

Diabetes was used to see how it would reshape the overall health/parental strain relationship with socioeconomic status (see Table 9 below). Among children with diabetes, the risk of reporting poor/fair health is 34.9% for families with incomes at or below the poverty line, whereas the risk of reporting poor/fair health is 20.8% for families with incomes 400%+ the poverty line. Thus, among children with diabetes, low income increases the risk of poor/fair health 1.68 times. Among children without diabetes, the risk of reporting poor/fair health is 7.0% for families with incomes at or below the poverty line, whereas the risk of reporting poor/fair health is 1.1% for families
with incomes 400%+ above the poverty line. Thus, among children without diabetes, low income increases the risk of poor/fair health 6.36 times.

\[
\frac{\text{Risk With Diabetes}}{\text{Risk Without Diabetes}} = \frac{1.68}{6.36} = 0.26
\]

A chi-square test was conducted that showed the significance within the two groups: children with diabetes and children without. The chi-square statistic for this measure was 8274.446 with degrees of freedom equaling 4. The 0.26 measurement given above suggests that the relationship between poverty and risk of poor childhood health is much weaker for children with diabetes with parents who have low incomes.

Diabetes was then used to look at how it may reshape the relationship between education and overall health (see Table 9 below). Among children without diabetes, the rate of reporting poor/fair health is 8.8% for children whose parents’ education is below a high school degree, whereas the risk of reporting poor/fair health is 1.4% for children whose parents’ education is at college degree or above. Thus, among children without diabetes, low education increases the risk of poor/fair health 6.29 times.

\[
\frac{\text{Risk With Diabetes}}{\text{Risk Without Diabetes}} = \frac{2.18}{6.29} = 0.34
\]

This suggests that the relationship between education and risk of poor childhood health is much weaker for children with diabetes. The cross-tabulation used to describe this relationship had a chi-square value of 7644.426, with the degrees of freedom equaling 4. The chi-square test shows significance within the two groups of children with diabetes and children without diabetes. The socioeconomic status relationship is thus reshaped by diabetes because diabetes suppresses the relationships between income,
education, and overall health.

An exploratory finding was deducted looking at the relationship between higher education and higher health outcomes. Among children with diabetes, the rate of reporting excellent/very good health is 20.0% for children whose parents’ education is below a high school degree, whereas the rate of reporting excellent/very good health is 52.1% for children whose parents’ education is at college degree or above. Thus, among children with diabetes, higher education increases the probability of excellent/very good health 2.61 times. Among children without diabetes, the rate of reporting excellent/very good health is 65.6% for children whose parents’ education is below a high school degree, whereas the risk of reporting excellent/very good health is 92.0% for children whose parents’ education is at college degree or above. Thus, among children without diabetes, higher education increases the probability of excellent/very good health 1.40 times.

\[
\frac{\text{Probability With Diabetes}}{\text{Probability Without Diabetes}} = \frac{2.61}{1.40} = 1.86
\]

The 1.86 measurement given above suggests that the relationship between higher income and the probability of of excellent/very good childhood health is much stronger for children with diabetes who have parents with higher education statuses. Parents who have a more quality and higher education status thus helps children with diabetes more in terms of overall health.

As discussed earlier, the chi-squares for each of these tests are only showing significance within the groups of children having diabetes and children not having
diabetes. The chi-square test was not used to show significance between groups due to the low cell count of children having diabetes in general, but also the low cell count of the lower end of the education and income variables.

The relationship between parental strain and SES factors were then examined with diabetes being a modifying factor (see Table 10 below). Among children with diabetes, the rate of reporting parental strain is 4.0% for children whose parents’ education is below a high school degree, whereas the risk of reporting parental strain is 3.1% for children whose parents’ education is at college degree or above. Thus, among children with diabetes, low education increases the risk of parental strain 1.29 times. Among children without diabetes, the rate of reporting parental strain is 5.4% for children whose parents’ education is below a high school degree, whereas the risk of reporting parental strain is 1.0% for children whose parents’ education is at college degree or above. Thus, among children without diabetes, low education increases the risk of parental strain 5.4 times.

\[
\frac{\text{Risk With Diabetes}}{\text{Risk Without Diabetes}} = \frac{1.29}{5.4} = 0.24
\]

This suggests that the relationship between education and risk of poor parental strain is much weaker for children with diabetes. The chi-square value for the cross-tabulation between parental strain and education was 1143.576 with the degrees of freedom being 2. This suggests a significant relationship within the groups of having parental strain or not, but does not differentiate between groups.

The second factor concerning SES, income, was then analyzed with diabetes being a mediating group (see Table 10 below). Among children with diabetes, the risk of
reporting parental strain is 0.0% for families with incomes at or below the poverty line, whereas the risk of reporting parental strain is 2.5% for families with incomes 400%+ above the poverty line. The data is insignificant and therefore no conclusions can be made about the relationship between income and parental strain. Among children without diabetes, the risk of reporting parental strain is 3.6% for families with incomes at or below the poverty line, whereas the risk of reporting parental strain is 0.9% for families with incomes 400%+ the poverty line. Thus, among children without diabetes, low income increases the risk of parental strain 4 times.

The chi-square value for the cross-tabulation of poverty level and parental strain was 906.444 with the degrees of freedom being 2. Although this does show significance, parental strain was a limitation of the study because the outcomes were so much lower than expected when conducting the research. With a total number of respondents saying yes to parental strain being so low (n=2200), it cannot be statistically determined that parental strain was dependent on SES or diabetes.
Table 9: Income and Education Association with Health by Diabetes

<table>
<thead>
<tr>
<th>Parental Rated Health – Without Diabetes</th>
<th>At or below poverty line</th>
<th>101%-399% above poverty line</th>
<th>400%+ above poverty line</th>
<th>Below high school degree</th>
<th>High school degree to some college</th>
<th>College degree or above</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent/Very Good Good</td>
<td>71.4%</td>
<td>83.0%</td>
<td>92.9%</td>
<td>65.6%</td>
<td>81.3%</td>
<td>92.0%</td>
</tr>
<tr>
<td>Good</td>
<td>21.6%</td>
<td>13.9%</td>
<td>6.0%</td>
<td>25.5%</td>
<td>15.1%</td>
<td>6.6%</td>
</tr>
<tr>
<td>Fair/Poor</td>
<td>7.0%</td>
<td>3.2%</td>
<td>1.1%</td>
<td>8.8%</td>
<td>3.5%</td>
<td>1.4%</td>
</tr>
<tr>
<td>Parental Rated Health – With Diabetes</td>
<td>At or below poverty line</td>
<td>101%-399% above poverty line</td>
<td>400%+ above poverty line</td>
<td>Below high school degree</td>
<td>High school degree to some college</td>
<td>College degree or above</td>
</tr>
<tr>
<td>Excellent/Very Good Good</td>
<td>39.5%</td>
<td>40.5%</td>
<td>47.9%</td>
<td>20.0%</td>
<td>29.7%</td>
<td>52.1%</td>
</tr>
<tr>
<td>Good</td>
<td>25.6%</td>
<td>26.6%</td>
<td>31.4%</td>
<td>32.0%</td>
<td>41.9%</td>
<td>25.9%</td>
</tr>
<tr>
<td>Fair/Poor</td>
<td>34.9%</td>
<td>32.9%</td>
<td>20.8%</td>
<td>48.0%</td>
<td>28.4%</td>
<td>22.0%</td>
</tr>
</tbody>
</table>
Table 10: Income and Education Associations with Parental Strain by Diabetes

<table>
<thead>
<tr>
<th>Parental Strain</th>
<th>At or below poverty line</th>
<th>101%-399% above poverty line</th>
<th>400%+ above poverty line</th>
<th>Below high school degree</th>
<th>High school degree to some college</th>
<th>College degree or above</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parental Strain</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>– Without</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No parental</td>
<td>96.4%</td>
<td>97.9%</td>
<td>99.1%</td>
<td>94.6%</td>
<td>98.2%</td>
<td>99.0%</td>
</tr>
<tr>
<td>strain</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parental strain</td>
<td>3.6%</td>
<td>2.1%</td>
<td>0.9%</td>
<td>5.4%</td>
<td>1.8%</td>
<td>1.0%</td>
</tr>
<tr>
<td>Parental Strain</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>– With</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No parental</td>
<td>100.0%</td>
<td>93.7%</td>
<td>97.5%</td>
<td>96.0%</td>
<td>97.3%</td>
<td>96.9%</td>
</tr>
<tr>
<td>strain</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parental strain</td>
<td>0.0%</td>
<td>6.3%</td>
<td>2.5%</td>
<td>4.0%</td>
<td>2.7%</td>
<td>3.1%</td>
</tr>
</tbody>
</table>
Discussion

Overall, the research study conducted provided information about how diabetes can influence the association between socioeconomic status (SES) and children’s overall health. The surveys administered by NSCH provided a data set that helped analyze how diabetes can be a factor in these associations. My findings suggest that diabetes does in fact compress the relationships between all variables, except for the exploratory finding discussed in the three-way associations. As was expected, there was a statistically significant impact that diabetes had in all categories. This finding is consistent with the literature discussing fundamental cause theory and life-course research. Among children without diabetes, the association between SES and all health outcomes were much stronger than among children with diabetes. Although diabetes weakened the relationship, it did not diminish it. This provides evidence for the fundamental cause theory by Link and Phelan due to the existing nature of social determinants still affecting overall health. This evidence consistently shows that chronic conditions such as diabetes strongly moderate the relationship between SES and health. Fundamental Cause Theory might need to be broadened to consider chronic conditions suppressing the relationship between health and social determinants because even though there are clear significant associations in the results, limitations to this theory still arise.

The exploratory research looking into how diabetes affects the relationship between high education and excellent/very good overall health proved to show opposite of every other finding. Diabetes in children provided a stronger relationship between a higher education and excellent/very good overall health. This challenges the
Fundamental Cause Theory because a diabetes diagnosis results in the exact opposite of suppressing the relationship of higher education and excellent/very good overall health. It is in fact providing incentive to be more highly educated which in turn creates overall health. Unlike the other end of the spectrum where diabetes suppressed the relationship between low education and overall health, it is acting as an aid in this sense. This could be due to the fact that already educated parents who unexpectedly receive the news that their child has a chronic illness might take measures to be more educated on how to help their child cope and prepare for later health outcomes. Parents who are more comforting and provide a more positive, intellectual understanding and attitude towards their children who have a chronic condition can provide more comfort and a positive outlook on what is happening with them (Woodson et al. 2015).

A limitation of this study was the small sample size. Although there were a total number of 156,986 survey children, only a limited number had parents with low levels of education, low income, and parental strain. Due to these small numbers, a larger survey should be conducted that applies all children within families studied instead of just one. Due to the fact that type 1 diabetes is genetic, it is possible that other children within the family did also have the disease at the time of the survey. This research thus does not provide the understanding of all children, only the one’s who were randomly selected from the families surveyed.

Surveys for future research should focus on disadvantaged families with children with chronic conditions. Although the research presented an argument that showed the health risks and disadvantages of low-income and low-educated households, most of the
participants were higher-income and highly educated. It would thus be important to expand this research and focus it more on the lower status individuals to see how much parents’ social factors are truly influencing their children’s overall health. Subjective social understanding of individuals can provide how they view their health, illness, disability, and other mental and physical conditions they may have (Demakakos et al. 2008). Providing a more in-depth analysis of participants rather than just a basic questionnaire could thus present greater understanding of how social factors influence overall health. This may clarify whether or not these findings support Fundamental Cause Theory. Although this study does not fully consider, such factors could be contributing to the disparities found in the findings. Age of parents may also affect education, and could be a more specific avenue of research.

Providing a better understanding of the associations between social determinants and overall health will incentivize families to consider social factors when dealing with something as serious as a chronic condition. Due to the strong association between socioeconomic status and overall health, providing education subsidies for lower-income families about health benefits will in turn improve health for both parents and children. Chronic conditions can play a strong role influencing in these relationships, making it imperative to continue this research and provide public health access that benefits the utmost vulnerable rather than the majority. Policy makers should consider programs for parents of children with chronic conditions.

**Conclusion**

Chronic conditions can not only affect a child physiologically and physically, but
they also play an important role in the network of social relations. Since children are not necessarily capable of understanding the nuances of managing a chronic condition, the role of the parent becomes especially vital. This research study furthered the discussion of how social determinants can affect the relationship of overall health of children by expanding the scope to include those with chronic health problems. Although diabetes subdued the relationship between SES factors and parental rated strain and child’s overall health, there was still clear influence of social factors shaping different outcomes of children’s health.

Research that integrates social and medical facets of disease and looks closely into how a person’s social milieu, not just their physical state, plays a role into understanding the everyday life in those engaged in the healthcare system. This more holistic perspective on disease is critical to understanding differences between communities and people. Continuing to expand public discourse on how social determinants shape a person’s experiences early on in the life course, and influence outcomes in their lives as adults, will guide efforts to providing greater access to healthcare in impoverished, low educated regions. Unfortunately, there is no single strategy or solution in terms of improving quality of life for those with early childhood chronic diseases. Continuing to examine such populations and encourage legislation that provides all children with better medical treatment will deliver a path to improvement.

Most of the proposed changes will take time and effort, but continuing research and examining relationships between health conditions and social determinants will have the potential to create positive and active change towards better health for underserved
communities. Instead of focusing on the aftermath disease from a top-down approach that generalizes public health in all spheres, it is crucial to investigate patterns of disadvantage to break down the continued expansion of health inequalities from a fundamental perspective (Goldberg 2014). Fully capturing the role of social determinants in health and creating public awareness that emphasizes the importance of improving the quality of life for the most vulnerable can lessen the impact of social inequalities that are still prevalent in regards to health. As results from the study suggests, future research concerning Fundamental Cause Theory ought to incorporate life-course dimensions of chronic disease and how these conditions may shape certain relationships between social determinants and health.
Appendix: Code

GET
   DATASET NAME DataSet2 WINDOW=FRONT.

SAVE OUTFILE = 'subset07.sav'
   /KEEP K2Q01 K8Q30 EDUC_MOMR EDUC_DADR POVERTY_LEVELR age3_07 K2Q41A

GET FILE = 'subset07.sav'

RECODE K2Q01 (1=1) (2=1) (3=2) (4=3) (5=3) (6=SYSMIS) (7=SYSMIS) INTO health_cat.
   VARIABLE LABELS health_cat 'Overall Health'.
   EXECUTE.

RECODE K8Q30 (1=0) (2=0) (3=1) (4=1) (6=SYSMIS) (7=SYSMIS) INTO p_strain.
   VARIABLE LABELS p_strain 'Parental Strain'.
   EXECUTE.

RECODE POVERTY_LEVELR (1=1) (2=2) (3=2) (4=2) (5=2) (6=3) (7=3) (8=3) (SYSMIS=SYSMIS) INTO
   ses_poverty.
   VARIABLE LABELS ses_poverty 'Poverty Level'.
   EXECUTE.

RECODE K2Q41A (1=1) (0=0) (6=SYSMIS) (7=SYSMIS) INTO sc_diabetes.
   VARIABLE LABELS sc_diabetes 'Diabetes'.
   EXECUTE.

RECODE EDUC_MOMR (6=SYSMIS) (7=SYSMIS).
   EXECUTE.

RECODE EDUC_DADR (6=SYSMIS) (7=SYSMIS).
   EXECUTE.

RECODE EDUC_MOMR (1=1) (2=2) (SYSMIS=SYSMIS) (3=3) INTO p_educ.
   VARIABLE LABELS p_educ 'Highest education of either parent'.
   EXECUTE.

IF (p_educ < EDUC_DADR) p_educ=EDUC_DADR.
   EXECUTE.

RENAME VARIABLES (age3_07 = age).

SAVE OUTFILE = 'final_07.sav'
   /KEEP age health_cat p_strain ses_poverty sc_diabetes p_educ

GET FILE = 'final_07.sav'

ADD FILES /FILE=*
   /FILE="/Users/soniaseligova/final_1112.sav'.

EXECUTE.

SAVE OUTFILE = 'honors_final.sav'

GET
   FILE='/Users/soniaseligova/Desktop/honors_final.sav'.
DATASET NAME DataSet5 WINDOW=FRONT.

FREQUENCIES VARIABLES=age health_cat p_strain ses_poverty sc_diabetes p_educ
   /ORDER=ANALYSIS.

SELECT IF(NOT MISSING(age)).
EXECUTE.

SELECT IF(NOT MISSING(health_cat)).
EXECUTE.

SELECT IF(NOT MISSING(p_strain)).
EXECUTE.

SELECT IF(NOT MISSING(ses_poverty)).
EXECUTE.

SELECT IF(NOT MISSING(sc_diabetes)).
EXECUTE.

SELECT IF(NOT MISSING(p_educ)).
EXECUTE.

FREQUENCIES VARIABLES=age health_cat p_strain ses_poverty sc_diabetes p_educ
   /ORDER=ANALYSIS.

CROSSTABS
   /TABLES=age BY sc_diabetes
   /FORMAT=AVALUE TABLES
   /STATISTICS=CHISQ
   /CELLS=COUNT COLUMN
   /COUNT ROUND CELL.

CROSSTABS
   /TABLES=health_cat BY sc_diabetes
   /FORMAT=AVALUE TABLES
   /STATISTICS=CHISQ
   /CELLS=COUNT COLUMN
   /COUNT ROUND CELL.

CROSSTABS
   /TABLES=p_strain BY sc_diabetes
   /FORMAT=AVALUE TABLES
   /STATISTICS=CHISQ
   /CELLS=COUNT COLUMN
   /COUNT ROUND CELL.
CROSSTABS
/TABLES=ses_poverty BY sc_diabetes
/FORMAT=AVALUE TABLES
/STATISTICS=CHISQ
/CELLS=COUNT COLUMN
/COUNT ROUND CELL.

CROSSTABS
/TABLES=p_educ BY sc_diabetes
/FORMAT=AVALUE TABLES
/STATISTICS=CHISQ
/CELLS=COUNT COLUMN
/COUNT ROUND CELL.

CROSSTABS
/TABLES=health_cat BY ses_poverty
/FORMAT=AVALUE TABLES
/STATISTICS=CHISQ
/CELLS=COUNT COLUMN
/COUNT ROUND CELL.

CROSSTABS
/TABLES=health_cat BY p_educ
/FORMAT=AVALUE TABLES
/STATISTICS=CHISQ
/CELLS=COUNT COLUMN
/COUNT ROUND CELL.

CROSSTABS
/TABLES=p_strain BY ses_poverty
/FORMAT=AVALUE TABLES
/STATISTICS=CHISQ
/CELLS=COUNT COLUMN
/COUNT ROUND CELL.

CROSSTABS
/TABLES=p_strain BY p_educ
/FORMAT=AVALUE TABLES
/STATISTICS=CHISQ
/CELLS=COUNT COLUMN
/COUNT ROUND CELL.

CROSSTABS
/TABLES=health_cat BY ses_poverty BY sc_diabetes
/FORMAT=AVALUE TABLES
/STATISTICS=CHISQ
/CELLS=COUNT COLUMN
/COUNT ROUND CELL.

CROSSTABS
/TABLES=health_cat BY p_educ BY sc_diabetes
/FORMAT=AVALUE TABLES
/STATISTICS=CHISQ
/CELLS=COUNT COLUMN 
/COUNT ROUND CELL.

CROSSTABS 
/TABLES=health_cat BY p_educ BY sc_diabetes 
/FORMAT=AVALUE TABLES 
/STATISTICS=CHISQ 
/CELLS=COUNT COLUMN 
/COUNT ROUND CELL.

CROSSTABS 
/TABLES=p_strain BY ses_poverty BY sc_diabetes 
/FORMAT=AVALUE TABLES 
/STATISTICS=CHISQ 
/CELLS=COUNT COLUMN 
/COUNT ROUND CELL.

CROSSTABS 
/TABLES=p_strain BY p_educ BY sc_diabetes 
/FORMAT=AVALUE TABLES 
/STATISTICS=CHISQ 
/CELLS=COUNT COLUMN 
/COUNT ROUND CELL.
References


Blackman, Scott M et al. 2014. "Insulin Pump Use In Young Children In The T1D Exchange Clinic Registry Is Associated With Lower Hemoglobin A1c Levels Than Injection Therapy". Pediatric Diabetes 15(8):564-572.


