Research Article

A STUDY OF HEALTH DETERMINANTS ASSOCIATED WITH DISEASE PREVALENCE AMONG AMERICAN CHILDREN

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ABSTRACT

High disease prevalence rates continue to significantly impact illness and mortality rates of American children. Therefore, an investigation of specific identifiable risk factors which may be associated with negative health outcomes among children's groups may therefore be warranted.

A large randomly drawn sample ($N = 422,599$) of boys ($n = 198.960$) and girls ($n = 223,639$) ages 4 to 12, was examined in this research study to test for the association between disease prevalence and the factors of Healthcare Quality, Household Income, Race, and Gender. The Pearson Chi Square test for Association was applied to measure for significant variable associations in this research study. This research study examined inpatient admissions for pediatric patients using the Kids´ Inpatient Database (KID), Healthcare Cost and Utilization Project (HCUP), Agency for Healthcare Research and Quality (AHRQ, 2016).

The results of this study found that there were statistically significant associations between negative disease outcomes and identifiable risk factors which were investigated ($p< .05$).

The findings from this research study provide support for establishing the initiatives which may assist in reducing disease and illness rates among children's groups.

INTRODUCTION

Research has shown that social, behavioral, and familial factors may be associated with various types of preventable diseases among children's groups (Yu, Du, Chiou, Feng, Chung, Yang, Chen, Chien, Hwang, & Chen, 2016). The World Health Organization recently reported that about 1.3 million children died in 2015, mostly from preventable or treatable diseases. Although respiratory infections have been listed as one of the main causes of death for children worldwide in 2015, Influenza, Digestive Disorders, Viral Infections, Obesity, Depression, and Type II Diabetes were found to be some of the most common serious children's health conditions (Clarke, 2014; WHO, 2016).

Previous research has shown that children in the United States have been diagnosed with serious acute and chronic health conditions and diseases in progressively high numbers (Compas, Jaser, Dunn, & Rodriguez, 2012). Therefore, an examination of negative children's health outcomes in the United States may be warranted to investigate moderate to severe risk factors which may be associated with specific preventable health issues and disease prevalence rates among American Children.

Mehta, Lee, and Ylitalo (2013) found that children residing in both low and middle-income households are more susceptible to preventable diseases, racial and ethnic disparities when seeking quality healthcare, and higher rates of illnesses. Additionally, there may be a growing effort to explore additional factors which may also attribute to poor health among children's groups. Recent studies suggest that there are currently worldwide efforts in place to develop effective health related goals to try and reduce children's disease and mortality rates (Cha, 2017). To support such initiatives, current policies should address potential factors which may be associated with disease and negative health related out comes among children worldwide. The implementation of preventive medicine practices may critical to reducing the prevalence of disease rates among children's groups.

The purpose of this study was to examine potential risk factors associated with disease prevalence for children ages 4 to 12, who reside throughout the U.S. Data was acquired from the Healthcare Cost and Utilization Project (HCUP), Agency for

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Healthcare Research and Quality (AHRQ, 2016) database. A primary objective for this research study was to provide educational and disease prevention resources to assist to promote both knowledge and public awareness of some of the potential acute and chronic diseases which may be associated with identifiable risk factors to promote behavioral modification and healthy lifestyle changes among American children and adults.

MATERIALS AND METHODS

A large randomly drawn sample (N = 422,599) of boys (n = 198,960) and girls (n = 223,639) ages 4 to 12, was examined in this research study to determine if the factors of Healthcare Quality(HQ), Household Income(HI), Race (RACE), and Gender (GEN) may be associated with disease prevalence in American children. The identifiable preventable negative health outcomes which were examined in this study were Bronchial Asthma (BA), Cardiovascular Disease (CVD), Heart Failure (HF), Epileptic Seizures (ES), Digestive System Disorders (DSD), Diabetes (DIA), Pneumonia (PNEU), Respiratory Disease (RD), Mental Disorders (MEN), Diseases of the Central Nervous System (DCNS), Viral Infections (VI), and Depression (DEP). The Pearson Chi Square test for Association was applied to measure for statistically significant variable associations in this research study. This research study investigated official inpatient admissions logs for pediatric patients using the Kids´ Inpatient Database (KID), Healthcare Cost and Utilization Project (HCUP), Agency for Healthcare Research and Quality (AHRQ, 2016).

The determination of whether a child was classified as economically disadvantaged, was based on one's household income, which served as a determinant of a child's economic status. Approximately 48% of the children were reported as living in households with an annual income of $10,000 or less. Each child's zip code was also verified to determine if a child resided in an economically disadvantaged community during the time of the analysis. The sample of children gathered from the HCUP dataset showed that 46% were White, 17% were Black, 20% were Hispanic/Latino, 12% were categorized as other, 4% were Asian/Pacific Islander, and 1% were identified as Native American. 54% of the children were classified to a minority ethnic group. 47% of the children were males (n = 198,960) and 53% of the children were females (n = 223,639).

This research study examined the association between children's disease outcomes and potential identifiable risk factors. The HCUP data contained categorical data which warranted the application of a non-parametric testing method. The Chi Square Test for Association was applied to determine the association between all study variables of interest. The factor of RACE was based on the number of children's cases which were classified as minorities or non-whites. Healthcare Quality (HQ) was based on the number of valid and invalid medical procedures applied to the total number of children's inpatient hospital cases. Household Income (HI) was based on the total number of children's cases who resided in households which had a reported annual income which fell below the poverty level limit, and the factor of Gender (GEN) reflected the total number of male and female children's cases which were examined in this study. The four factors which were examined in the study were each tested for associations with each of the twelve disease outcomes.

Cramer's V statistics were used to measure the strength of association for each study factor and disease outcome variable of interest. When the Chi Square test for association method is applied to assess a 2 X 2 cross tabulation table, the best measure to test for strength of association is Cramer's V, which also serves as the best measure for strength of association when assessing a cross tabulation table larger than 2 X 2 (Statistics Solutions, 2016). Figure 1 (Statistics Solutions, 2016) represents the standard for assessing the strength of association when analyzing Cramer's V coefficients.

Figure 1 Standard for Cramer's V Coefficients

Levels of Association	Strength of Association
< . 10	Weak
.11 to .30	Moderate
.31 to .35	Strong
> .35	Very Strong

RESULTS

The results of the Chi Square Analyses found statistically significant associations (p< .05) between HQ and ten of the twelve disease outcomes (See Table 1). No significant associations were found between HQ and the factors of ES and DEP. There were statistically significant associations found between HI and each of the disease outcomes (p< .001), with the exception of the factor of ES (See Table 1). Statistically significant association were found between RACE and nine of the disease outcomes (p<.05). There were no significant associations found between RACE and the factors of PNEU, ES, and MEN (p> .05) (See Table 1). Additionally, statistically significant associations were found between GEN and nine disease outcomes (p< .05), and no significant associations were found between GEN and the factors of PNEU, ES, and MEN (p> .05) (See Table 1).

Table 1 Chi Square Test for Association

	HQ	HI	RACE	GEN
CVD	**	**	**	**
HF	**	**	**	**
VI	**	**	*	*
PNEU	**	**	NS	NS
BA	.*	**	**	**
DCNS	*	**	**	**
ES	NS	NS	NS	NS
DSD	*	**	**	**
DIA	*	**	*	*
RD	**	**	**	**
MEN	**	**	NS	NS
DEP	NS	**	**	*

a = .05
*= Statistical Significance p< .05
**= Statistical Significance p< .01
NS = Not Statistically Significant

Cramer's coefficients revealed very strong associations between the four identifiable risk factors and the twelve disease outcomes (See Table 2). A Moderate association was found between GEN and DEP (*Cramer's V*=.143). Weak associations were found between HQ and BA (*Cramer's V* =. 009), HQ and DCNS (*Cramer's V* = .007), RACE and VI (*Cramer's V* = .008), and GEN and VI (*Cramer's V* = .056). There were no associations found between HQ and ES, HQ and DEP, HI and

ES, RACE and PNEU, RACE and ES, RACE and MEN, GEN and PNEU, GEN and ES, and GEN and MEN (*Cramer's V* = .000). Cramer's V coefficients greater than .35, imply that there is a very strong association between the measured variables, but the variables may measure the same concept (Cramer, 1946; Statistics Solutions, 2016).

Table 2 Cramer's V Analyses – Strength of Association

	HQ	HI	RACE	GEN
CVD	.959	.675	.956	.955
HF	.980	.976	.979	.978
VI	.969	.976	.008	.056
PNEU	.916	.890	.NA	NA
BA	.009	.900	.910	.908
DCNS	.007	.852	.866	.864
ES	NA	NA	NA	NA
DSD	.920	.950	.913	.912
DIA	.967	.960	.364	.461
RD	.714	.675	.697	.694
MEN	.516	.491	NA	NA
DEP	NA	.643	.640	.143

NR = No Association

DISCUSSION

The findings from this research study may assist in promoting the significance of the implementation of effective children's preventive medicine strategies, based upon the analyses results of this study which show both significant and strong associations between disease prevalence, one's gender, race, economic background, and the quality of healthcare provided. The results of the research provide no indication that the identifiable risk factors may influence epileptic seizures in children and that mental disorders are significantly impacted more by a child's ability to afford or receive quality healthcare rather than a child's race or gender affiliation.

Future Scope

The outcome of this research study may be used to promote and support nationwide efforts to address risk factors which may linked to negative health outcomes in children. To reduce disease prevalence rates and to improve the health status among children's groups, health educational initiatives which address the importance of gender equity, healthcare quality, economic development, and racial injustices, may assist in the establishment of appropriate health behavioral practices and the elimination of health disparities in children in America and around the world. American health organizations and agencies should continue efforts to establish and promote effective health related policies which may generate strong outreach initiatives within children's educational and recreational environments. The development of cultural awareness initiatives may also serve to generate dialogue and understanding among target populations which show significantly moderate to high rates of economic, racial, and gender forms of health related disparities.

Ensuring the healthy status of American children may require a serious preventive medicine strategic approach. Such an approach could be complimented by the establishment and maintenance of key collaborative partnerships between American agencies, institutions, as well as local, regional, state, and governmental health departments and facilities, which have demonstrated successful approaches to disease prevention and control measures among children. Through such efforts and initiatives, it may be possible for communities which have not shown success in maintaining the health of children's groups, to learn of methods which have been proven to be effective in other communities in order to achieve the common goal of ensuring good health of American children and children abroad.

References

Cha, S. (2017). The impact of the worldwide Millennium Development Goals campaign on maternal and under-five child mortality reduction: 'Where did the worldwide campaign work most effectively?: Global Health Action Vol. 10 , Issue. 1.

Clarke, C. (2014). Healthy Kids: Top 10 childhood illnesses. The West Australian. West Australian Newspapers Limited.

Compas, B. E., Jaser, S. S., Dunn, M. J., & Rodriguez, E. M. (2012). Coping with Chronic Illness in Childhood and Adolescence. Annual Review of Clinical Psychology, 8, 455–480. http://doi.org/10.1146/annurev-clinpsy-032511-143108

Cramér, H. (1946). *Mathematical Methods of Statistics.* Princeton: Princeton University Press.

CUP Kids' Inpatient Database (KID). Healthcare Cost and Utilization Project (HCUP). (2016). Agency for Healthcare Research and Quality, Rockville, MD.

Mehta, N. K., Lee, H., & Ylitalo, K. R. (2013). Child health in the United States: Recent trends in racial/ethnic disparities. *Social Science & Medicine (1982)*, *95*, 6–15. doi:10.1016/j.socscimed.2012.09.011

Statistics Solutions (2016). Nominal Variable Association. Retrieved from: http://www.statisticssolutions.com/nominal-variable-association/World Health Organization, (2016). Adolescents: Health Risks and Solutions. Media Cente: Fact Sheet.

Yu, C. J., Du, J. C., Chiou, H. C., Feng, C. C., Chung, M. Y., Yang, W., Chen, Y. S., Chien, L. C., Hwang, B., &Chen, M. L. (2016). Sugar-Sweetened Beverage Consumption Is Adversely Associated with Childhood Attention Deficit/Hyperactivity Disorder. *Int. J. Environ. Res. Public Health*, 13, 678

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