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CANADIAN WOMEN AND CHILDREN HIT HARD BY THE IMPACTS OF FOOD INSECURITY - PART ONE

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ABSTRACT

With regards to the impact of food insecurity on women and children, it was found that there was a particularly high prevalence in these demographic groups (Che and Chen, 2001). Relationships exist between food insecurity and social, cognitive and physical outcomes among children as well as social and physical outcomes among adult women. This review of the literature also revealed that much of the existing research is based upon cross-sectional studies and self report. Additional research methods, such as those longitudinal in nature, would be beneficial in providing further clarity to food insecurity research. Furthermore, a need exists for additional Canadian studies on the impact of food insecurity on women and children.

Author's Note: The following is an excerpt of a paper written during the winter of 2007 as a fourth year independent study at the University of Guelph. This piece will be followed with an additional excerpt analyzing the impacts on food insecurity by a preventive program called "Better Beginnings, Better Futures," which takes place in eight Ontario communities. Recommendations for food banks, academia and government will also be included in the second excerpt, which will appear in the second issue of Esurio. This first piece will set the stage for the second by reporting on the social, cognitive and physical outcomes of food insecurity among children as well as social and physical outcomes among adult women

Introduction

According to Statistics Canada, over 10% of Canadians, equating to over 3 million people live in food insecure households (Che and Chen, 2001). With statistics like this identifying a growing reality, this paper sought to examine the social, physical and cognitive outcomes of food insecurity in children and women an extensive review of the literature. The following sections provide an overview of the social, cognitive and physical impacts of food insecurity on children and women.

The Impacts of Food Insecurity on Children

First and foremost, it should be noted that there is a lack of research specific to the impacts of food security on Canadian children. As a result, U.S. studies are also reviewed. Furthermore, only statistically significant findings will be presented in the discussion.

According to Canada's National Population Health Survey (Che and Chen, 2001), children 17 and under belonged to the age category most likely to live in a food insecure home. Children are likely even more affected than portrayed in the survey as it fails to account for those children who are homeless. In addition, over one quarter of children living in food insecure households compromise their diet (Che and Chen, 2001).

Impacts on Children's Social Development

The consequences of food insecurity on children's social development are widespread and range from emotional to behavioral correlates as well as mental health repercussions. In a cross sectional study of 328 parents and their children within the context of the Childhood Hunger Identification project in the US, the relationship between food insufficiency and psychosocial dysfunction was investigated (Kleinman et. al, 1998). Food insufficient children were more likely to have clinical levels of psychosocial dysfunction (21%) compared to children at risk for hunger (6%) or not hungry (3%). In addition, children identified as being hungry were "more likely to have a past or current history of mental health counseling that other children in the sample" (Kleinman et. al, 1998) with 21% of hungry children fitting these criteria in comparison to 12% of at risk children and 5% of non-hungry children. In the same study, those children experiencing hunger scored higher on numerous other items as well. For example, when comparing hungry children to those not experiencing hunger, 21% versus 3% were rated as fighting often, and 12% versus 0.9% were rated as often taking things that did not belong to them. Lastly, the prevalence of fighting in households which experienced frequent hunger was seven times that of those reporting no hunger and the prevalence of stealing was 12 times greater in these hungry households (Kleinman et. al, 1998).

Stormer and Harrison (2003) and Dunifon and Kowaleski-Jones (2003) (as cited by Jyoti et. al., 2005) echoed these types of findings showing that food insufficiency is related to poor social functioning through decreased levels of teacher-rated social ability as well as decreased levels of positive behaviour. The latter studied a sample of 3500 children aged 6-12 and an additional 5000 nationally representative families in the U.S. (Kowaleski-Jones, 2003, as cited by Jyoti et. al., 2005).

Whitaker, Phillips and Orzol (2006) found that increasing food insecurity levels also have increasing negative impacts on children. Based on a cross-sectional study with a sample size of 2870, they found that behavioural problems in children increased with increasing food insecurity (22.7% in fully food secure, 31.1% in marginally food secure, and 36.7% in food insecure categories). The study again was American and focused on mothers of three-year-old children in 18 large U.S. cities.

The mounting evidence suggesting that food insecurity is related to negative social development, is supported by a longitudinal study with ~21,000 children entering kindergarten who were followed until grade 3. Not only was it found that boys experiencing food insecurity showed a greater decline in social skills, but a change in status from food secure to food insecure was associated with reduced gains in social skills compared to a change from food insecure to food secure status, or even in comparison to persistently food-insecure households (Jyoti et. al., 2005).

Lastly, for adolescents, even more severe symptoms such as depressive disorders and suicide, are related to food insufficiency. In a sample of 754 15 and 16-year-old adolescents, it was found that food insufficient adolescents were four times more likely to have had dysthymia, twice as likely to have thoughts of death, over three times more likely to have had a desire to die and five times more likely to have attempted suicide in comparison to their food-sufficient counterparts (Alaimo et. al., 2002).

Impacts on Children's Cognitive Development

Cognitive deficits, such as those involved in academic performance, have also been found to be more prevalent in children experiencing food insecurity. There are several ways in which food insecurity has been said to influence cognitive outcomes. Reid (2000, as cited by Ashiabi (2005)) asserted that food insecurity can impact "a child's energy level, resulting in feelings of hunger that are distracting, or impact a child's emotional and psychological health." Ashiabi (2005), through cross-sectional analysis of 11,614 children from the 1999 National Survey of American Families, indicated that there were effects on both direct and indirect relationships with school engagement which influences the likeliness of dropping out, problematic behaviours, and academic performance. Food insecurity predicted lower levels of school engagement directly as well as indirectly through health status and emotional well being (Ashiabi, 2005).

In terms of the more direct link between food insecurity and cognitive and academic outcomes, there is evidence from several studies. In a study of more than 20,000 kindergarten-aged children, it was found that "food insecurity at kindergarten predicted impaired academic performance in reading and mathematics for boys and girls" (Jyoti et. al., 2005). Moreover, a lack of food is associated with lower mathematics skills, the repeating of grades and being late or absent from school in children 6-12 years of age (Jyoti et. al., 2005). In addition, in an investigation by Winicki and Jemison (2003) (as cited by Jyoti et. al., 2005) it was found that if a kindergarten-aged child exhibited a factor associated with food insecurity, this was related to difficulties in learning math during the kindergarten year.

Moreover, there is evidence supporting a relationship between food insecurity and children's academic failure. Although only marginally significant (P< .10) 25% of hungry children versus 19% of children at risk of hunger and 12% of non-hungry children had repeated a grade (Kleinman, et. al., 1998).

Lastly, it has been found that with participation in programs such as the Food Stamp Program (FSP) in the U.S., children show an improvement in academic performance. A large longitudinal study found that "from kindergarten to third grade, children in households that started FSP participation had a 3-point greater change in both reading and mathematics scores than did children in households that stopped FSP participation" (Frongillo, Jyoti, and Jones, 2006). It is important to note that these findings were only significant for girls.

Impacts on Children's Physical Development

In addition to the social and cognitive consequences of food insecurity among children, there are also many physical consequences that result. Firstly, several studies have reported that food insecurity is associated with children being overweight. Jyoti et. al, (2005) found that kindergarten girls show greater increases in Body Mass Index (Kg/m2) when experiencing food insecurity and also suggest that there is a relationship with greater in weight gain in children who are living in food insecure households. Moreover, in a study by Alaimo et. al. (2001, as cited by Jyoti et. al., 2005) white girls aged 8-16 years were found to be over three times more likely to be overweight than their food sufficient counterparts.

Based on the 1999-2002 U.S. National Health and Nutrition Examination Survey, Casey et. al. (2007), found that both household and child food insecurity resulted in a higher chance of being at risk of overweight in children aged 12-17 in comparison to their non food insecure counterparts. After controlling for demographic factors such as ethnicity, age, gender, and family poverty index level, the only correlation that remained significant was that of child food insecurity with regards to being at risk for overweight status.

In addition to increasing the risk of being overweight, those in food insecure households were twice as likely to report their health as being fair/poor and a third more likely to have been hospitalized since birth in comparison to those children living in food secure homes, according to a study done in Washington D.C. On the positive side, there was no significant relationship between food insecurity and admission to the emergency department (Cook et. al., 2004). Food insecure children have also been shown to have significantly lower median serum zinc levels compared to food secure children (Broughton et. al., 2006). An additional study based on the data collected from 5667 children in the third U.S. National Health and Nutrition Examination, provides additional evidence (Alaimo, et. al, 2002). Even after family income, race/ethnicity, and other socio-demographic factors were controlled for, food insecure children were significantly more likely to be in poorer health, to have frequent stomach aches and headaches, and to have experienced more colds in the previous year in comparison to food secure children (Alaimo, et. al, 2002).

The Impact of Food Insecurity on Women

Compounding the severity of the issue of food insecurity is the rate at which it occurs among women. According to an analysis of the Canadian Community Health Survey, 16% of women in Canadian provincial households are food insecure, with the statistic jumping to an alarming 33% among single mothers (Ledro and Gervais, 2005). The proportion based upon Statistics Canada"s National Population Health Survey differs only slightly, reporting that 32% of households in which mothers are the sole parents showed some signs of food insecurity in the past year, with 28% having compromised their own diet (Che and Chen, 2001). The same report found that even after related factors such as income were taken out of the equation, lone-mother households were about one and a half more times more likely to be food insecure in comparison to dual parent households (Che and Chen, 2001).

Of the consequences of food insecurity in women, most research has been done on the physical implications, with limited studies on the social impacts, and literally none regarding the cognitive aspects. The latter is likely because of the lack of appropriate performance criteria. There is nothing comparable to measuring academic achievement in children. With this in mind, we will begin by examining the research that is available regarding the social elements pertaining to food insecurity among women and then proceed to the physical impacts.

Social Impacts in Women

In terms of the impact on mental health, one must recognize the possibility for bi-directionality, that is, not only the possibility that food insecurity causes mental health issues, but that mental health issues could cause food insecurity. With this in mind, information exists that suggests that it is indeed food insecurity that impacts mental health. There are at least two possible routes for this to occur, the first of which is, direct psychological consequences because of insufficient amounts of required nutrients. The second is that food insecurity may be perceived as stressful, resulting in self-blame and a lack of efficaciousness, ultimately degrading a person's sense of mastery (Gecas and Schwalbe, 1983; Kraus and Tran, 1989 (as cited by Heflin, et. al., 2005)). One prospective study with 753 women on welfare in the U.S. found that although no relationship existed between a change in food insecurity and a change in mastery (the extent that one perceives control over their life), it was found that a change in food insufficiency status was highly correlated with a change in major depression status (Heflin, et. al., 2005). An additional study based on a cross sectional survey of 2870 mothers of 3-year old children found that the percentage of mothers with either major depressive episode or generalized anxiety disorder increased with increasing food insecurity, even after the effect of potential confounding variables were controlled for. The proportions of women with either one of these conditions was 16.9% for women who were fully food secure, 21.0% for those marginally food secure, and 30.3% for food insecure (Whitaker, et. al. 2006). Moreover, based upon National Population and Health Survey data, those from food insufficient households were significantly more likely to be suffering from major depression and of having poor social support (Vozoris and Tarasuk, 2003). Social support was also related to food insecurity in a study by Tarasuk (2001b), as in that

investigation the likelihood of reporting food insecurity with moderate or severe hunger was much higher for those women who perceived themselves as socially isolated.

Physical Impacts in Women

In terms of the physical impacts of food insecurity, these range from nutritional inadequacies and health conditions to outcomes such as overweight. With regards to nutritional outcomes, one compelling hypothesis is that mothers compromise their own diets for the sake of their children. This line of thought is substantiated by an analysis of the 1994 National Longitudinal Survey of Children and Youth (McIntyre et. al., as cited by McIntyre et. al, 2003) which found that "34% of caregivers replied that they skipped meals or ate less when food was scarce compared with only 4.9% of their children." With the exception of folate and zinc, mothers" intakes consistently failed to meet requirements of nutrients and kilocalorie intake, whereas the intake of their children was consistently more adequate (McIntyre et. al., as cited by McIntyre et. al, 2003). More recently, a month-long study of low-income single mothers revealed that when using Estimated Average Requirements as reference points, more mothers than children had inadequate dietary intake. In fact, they had significantly lower intakes of each nutrient in comparison to their children. It was also found that at the third interview the children"s intakes had undergone a slight improvement (likely a result of receiving mid-month income such as the Child Tax Benefit or the Goods and Services Tax credit) whereas the mother"s intakes had not (McIntyre et. al, 2003). This indicates that mothers are often placing the nutritional needs of their children above their own, while creating negative impacts on their own health.

In terms of nutritional outcomes, both smaller samples within the context of community agencies as well as larger, nationally representative samples provide evidence of negative nutritional impact. One study (Tarasuk and Beaton, 1999) investigated the dietary intake of 153 women in families receiving emergency food assistance in Toronto. Women who reported household hunger during the past 30 days also reported lower energy and nutrient levels. Moreover, women showed a prevalence of inadequacy greater than 15% for vitamin A, folate, iron and magnesium. A follow up analysis (Tarasuk, 2001b) showed that the intake of items from the fruits and vegetables and meat and alternates food groups were lower in those women who were food insecure. In terms of health conditions, the same study noted that 40% of women reported having a long-standing health condition, illness or disability. Two thirds described the ailment as being activity limiting (Tarasuk and Beaton, 1999). Vozoris and Tarasuk (2004) reported that those from food insufficient households were significantly more likely to report poor/ fair health, have poor functional health, and restricted activity as well as multiple chronic conditions. Food insufficient individuals were also more likely to report having heart disease, diabetes, high blood pressure as well as allergies.

More generally, adults who are inadequately nourished are more likely to have lower functioning immune systems, take increased time to heal and stay in hospital longer as well as have more illnesses. Moreover, due to the lack of fruits and vegetables within the diet, increased risk of cardiovascular disease and cancer is a consequence. A lack of certain vitamins such as A, C and D, as well as certain minerals such as copper, zinc and

selenium, can have negative effects on immune function, thus increasing the risk of infection (Che and Chen, 2001).

As in the literature on food insecurity in children, there is evidence of a relationship between food insecurity and overweight in adult women. It has been suggested that among individuals who are experiencing food insecurity, the forces of weight loss and gain are opposing one another. Weight increases are attributed to gain after a period of disordered eating (such as that exists when there are inadequate food supplies) and weight loss is caused by food insecurity affecting weight status. The weight-gain scenario is at play in those who are mildly food insecure, where as weight loss is occurring within severely food insecure individuals (Frongillo et. al, 1997 as cited by Townsend et. al, 2001). Further evidence that food insecurity and overweight are indeed related in women comes from a study by Townsend et. al (2001) that examined 966 women in the U.S. Both mildly and moderately food insecure women were significantly more likely to be overweight than their food secure counterparts. The corresponding percentages of those overweight reporting food insecurity, were 41% (mildly food-insecure), 52% (moderately food insecure) and 34% (food secure). This effect of food insecurity on overweight status was found to be over and above that incurred by low income. In general it was observed that the prevalence of overweight was lower in the extremes of food insecurity, that is, in individuals who are food secure and severely food insecure, as they either voluntarily or non-voluntarily reduce their food intake (Townsend et. al., 2001). This is in contrast to those that are mildly and moderately food insecure, as they are subject to involuntary, temporary food restriction (Frongillo, et. al, 1997 as cited by Townsend, 2001). One potential cause of this phenomenon is what has been deemed as the food acquisition cycle. This cycle is said to exist due to periods within a month where food availability is high, often in correspondence with receiving social assistance, followed by periods of very little food because of exhausted financial resources nearing the end of the month (Wilde and Ranney, 2000, as cited by Townsend et. al, 2001). This cycle causes a situation where binge eating occurs during time of plenty followed by a period of temporary restriction, which repeats continually, possibly causing slow weight gain over time (Townsend et. al, 2001).

Summary

Relationships exist between food insecurity and social, cognitive and physical outcomes among children as well as social and physical outcomes among adult women. After examining the breadth of research in this growing field, one can make several important observations. Firstly, it is important to note that the vast majority of the research is cross sectional in nature, making causal inferences among the observed associations impossible. The variables that are related to food insecurity could potentially be caused by the social problem, although one also has to acknowledge the possibility of reverse causality or a third confounding variable in play. That being said, with the vast number of adverse outcomes that have been observed in such a variety of studies, it is likely that food insecurity plays an important role. An additional point to keep in mind is that the most data is based upon measures of self-report, which can be subject to errors in memory, judgement, as well as social-acceptability biases. Although these two limitations are important to note, with the use of human subjects there is always limited research methods available outside of a strict, likely unrealistic, laboratory setting. It

may be beneficial, however, to make more frequent use of other research techniques such as the longitudinal design.

Next, with the use of such a variety of measurement tools based upon numerous definitions of food insecurity, as well as the use of additional terms such as food sufficiency and hunger, it is difficult to compare the results of various studies. It would be beneficial for researchers to agree upon a standard definition and tool to utilize in further studies of household food insecurity so that such comparisons of future findings may be completed.

Lastly, caution must be taken when extrapolating American findings to a Canadian context. Although both are developed countries, many significant differences exist between the two societies such as health care systems, social programs and funding, tax benefits, social assistance, among any number of additional variables. With this in mind, additional research specifically conducted on Canadian populations would be beneficial in making recommendations for intervention and policy changes in this country. A nationally representative survey that also included the territories would also be helpful in providing more accurate prevalence rates.

References

Alaimo, K.; Olson, C.; Frongillo, E. (2002). Family food insufficiency, but not low family income, is positively associated with dysthymia and suicide symptoms in adolescents. Journal of Nutrition. 132(4) pp. 719-725.

Ashiabi,G. (2005). Household food insecurity and children"s school engagement. Journal of Children and Poverty. 11(1) pp. 3-17.

Broughton, M., et. al. (2006). Predictors and outcomes of household food insecurity among inner city families with preschool children in Vancouver. Canadian Journal of Public Health. 97(3) pp. 214-216.

Casey, et. al. (2007). The association of child and household food insecurity with childhood overweight status. Pediatrics. 118 (5) pp. E1406-E1413.

Che, J; Chen, J. (2001). Food insecurity in Canadian households. Statistics Canada Health Reports 12(4) pp. 11-22.

Cook, J. et. al. (2004). Food insecurity is associated with adverse health outcomes among human infants and toddlers. Journal of Nutrition. 314(6) 1432-1438.

Jyoti, D.; Frongillo, E.; Jones, S. (2005). Food insecurity affects school children"s academic performance, weight gain, and social skills. Journal of Nutrition. 135(12) pp. 2831-2839.

Kleinman, R. et. al. (1998). Hunger in children in the United States: potential behavioral and emotional correlates. Pediatrics 101(1) pp. 3-8.

Frongillo, E.; Jyoti, D.; Jones, S. (2006) Food stamp program participation is associated with better academic learning among school children. Journal of Nutrition136(4) pp.1077-1080.

Heflin, C. Siefert, K., Williams, D. (2005). Food insufficiency and women"s mental health: Findings from a 3-year panel of welfare participants. Social Science and Medicine. 61 pp.1917-1982.

Ledrou, I. Gervais, J. (2005). Food insecurity. Health Reports. 18(3) pp.47-51

McIntyre, L.; Glanville, T.; Raine, K.; Dayle, J.; Anderson, B.; Battaglia, N. (2003). Do low-income lone mothers compromise their nutrition to feed their children. Canadian Medical Association Journal. 168(6) 686-691.

Tarasuk, V.; Beaton, G. (1999). Women"s dietary intakes in the context of household food insecurity. Journal of Nutrition. 129(3) pp. 672-679.

Tarasuk, V. (2001b). Household food insecurity with hunger is associated with women"s food intakes, health and household circumstances. Journal of Nutrition. 131(10) pp. 2670-2676.

Townsend, M.; Peerson, J.; Love, B.; Achterberg, C.; Murphy, S. (2001). Food insecurity is positively related to overweight in women. Journal of Nutrition. 131(6) pp. 1738-1745.

Vozoris, N.; Tarasuk, V. (2003). Household food insecurity is associated with poorer health. Journal of Nutrition. 133 (1) pp. 120-126.

Vozoris, N.; Tarasuk, V. (2004). The health of Canadians on welfare. Canadian Journal of Public Health. 95(2) pp. 115-120.

Whitaker, R.; Phillips, S.; Orzol, S. (2006). Food insecurity and the risks of depression and anxiety in mothers and behavior problems in their preschool-aged children. Pediatrics. 118 (3) pp. 859-868.