Caregiver financial distress, depressive symptoms and limited social capital as barriers to children's dental care in a mid-western county in the United States

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Objective: To identify barriers to children's access to dental care. ***Basic research design:*** A cross-sectional health survey. ***Setting:*** All residential census tracts in Genesee County, Michigan, USA. ***Participants:*** 498 adults who reported having children in their households, extracted from 2,932 randomly selected adult participants in the 2009 and 2011 surveys. ***Main measures:*** Stepwise logistic regression was used to predict two dependent variables: children's lack of any visits to dentists' offices and unmet dental care needs (defined as needing dental care but not receiving it due to cost) in the previous year as reported by the adults. Independent variables included gender, age, education, race/ethnicity, financial planning, financial distress, fear of crime, stress, depressive symptoms, experiences of discrimination, and neighbourhood social capital. ***Results:*** Of the 498 adults, 29.9% reported that they had children who had not visited a dentist in the past 12 months and 13% reported that they had household children with unmet dental care needs in the past year. Adults who reported higher depressive symptoms, lower neighbourhood social capital, greater financial distress, and who were younger were more likely to have household children who did not visit a dentist in the past year. Financial distress was the only significant predictor when controlling for other variables to predict unmet dental care needs. ***Conclusions:*** Factors beyond financial distress affect children's dental care; these include parental depressive symptoms and lower neighbourhood social capital. Interventions promoting parental mental health and social integration may increase dental care among children.

Key words: *dental care, children, caregivers, financial distress, depressive symptoms, social capital, USA*

Introduction

Lower socioeconomic status is a well-established predictor of not visiting a dentist at all, not visiting a dentist for follow-up care, and having negative oral health outcomes in children (Edelstein and Chinn, 2009). In the United Stated, the most important barrier to visiting a dentist is the individual's financial situation rather than the community's availability of dentists (Wall *et al.*, 2014). Racial/ethnic differences in children's dental care use and oral health also persist. Specifically, African American children more often lacked any dental care visits in the previous year and had dental caries in their primary teeth than non-Latino White children (Edelstein and Chinn, 2009). Yet previous research showed that many other factors influenced dental care use (Chi and Carpiano, 2013; Iida and Rozier, 2013). In Andersen's (1995) behavioural model of health care access, three factors contribute to health care access, specifically predisposing characteristics (such as demographic determinants), enabling resources, and need. Andersen emphasised that enabling resources could both promote and prevent the utilisation of health care services. In this study, we focused on the enabling resources described below.

First, social capital is defined as collective resources such as trust, norms, and reciprocity accessible to individuals in a specific geographic location (Kawachi *et al.*, 2008). People who have neighbours who visit each other and who are willing to assist each other, for example, have higher levels of social capital. Andersen (1995) specifically discussed the importance of social relationships in the use of health care services. Social capital may promote dental care use through several mechanisms. One is through the diffusion of knowledge about dental care by social groups in the neighbourhood (Iida and Rozier, 2013). Informal social control may also promote healthy dental behavioural norms. In addition, social capital may build self-esteem, promote coping skills, and increase information on and access to local dental care services (Iida and Rozier, 2013).

Recent studies on the association between social capital and dental care have conflicting findings. A US study found that mothers with lower social capital had children who were more likely than others to forego dental care (Iida and Rozier, 2013). Conversely, studies of adults (Chi and Carpiano, 2013) and students (Furuta *et al.*, 2012) found higher levels of social capital were associated with lower use of dental care which might be interpreted as well-connected people sharing across their neighbourhood a low self-efficacy regarding their ability to find a dentist (Chi and Carpiano, 2013).

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Parental depressive symptoms are other factors beyond financial resources and race/ethnicity that may influence dental care among children. The levels of help-seeking coping strategies are lower in irregular than regular dental care adult attendees and adults with depressive symptoms tended to perceive dental visits as frightening (Bernson *et al.*, 2013). Parents with depressive symptoms may therefore not take their children to the dentist due to their weaker coping strategies or dental anxiety. Another U.S. study found that depressive symptoms among mothers were associated with lack of routine dental care among kindergarten children (Kavanaugh *et al.*, 2006).

Fear of neighbourhood crime, defined as the "*rational or irrational state of alarm or anxiety engendered by the belief that one is in danger of criminal victimization*" (McLaughlin, 2013), is yet another factor that may decrease dental care among children. Neighbourhood conditions that are sources of threat and danger among individuals include vandalism, public drinking and drug use, graffiti, and abandoned buildings. Parental depression caused by fear of crime may lead to lower health coping strategies among parents and subsequently reduced dental care utilisation among children. A study which combined questions on fear of crime and social capital in one scale found that increased neighbourhood safety and social capital among caregivers were associated with better oral health among children (Bramlett *et al.*, 2010).

The current study investigates children's barriers to obtaining dental care in Genesee County, Michigan U.S., where dental care coverage is available for the underserved through the Healthy Kids Dental (HKD) programme. Genesee County have experienced continued economic and population decline in part due to the closure of automobile plants with unemployment rising 4.1% in December 2000 to 9.8% in December 2011 (U.S. Department of Labour, 2014). The HKD programme is an enabling factor for health service utilisation (Andersen, 1995) covering services including examinations, X-rays, teeth cleaning, fluoride treatments, sealants, space maintainers, fillings, stainless steel or resin crowns, root canals, extractions, complete or partial dentures, and emergency treatment to alleviate pain. Patients must use a participating provider who then receives payments directly from the state instead of from the parents. To qualify for the programme, children should come from families who live below twice the federal poverty level, e.g. a family of two adults and two children qualifies if their total income is below $23,283 or $23,364 for a single parent with three children. This programme was recognised as a state model to increase dental care in the underserved (American Dental Association, 2004).

To assess the barriers to obtaining dental care in Genesee County, data from two waves of a demographically representative county-wide health survey were used. The measures included financial distress, a well-established factor found to be significant in the previous literature to predict access to dental care as well as additional constructs, such as social capital, depressive symptoms, and fear of crime that may be influential. This study thus sought to investigate caregiver/parental factors that may be related to lack of children's dental use, with a focus on financial distress, social capital, depressive symptoms, and fear of crime. The investigation focused on children whose caregivers/parents completed the health survey.

Method

To monitor and assess residents' health and health needs, investigate the influence of local programmes on health outcomes, and develop interventions to improve health in Genesee County, a committee developed the Prevention Research Centre of Michigan's Speak to Your Health! Community Survey. The survey committee was composed of academics and community members from the University of Michigan's School of Public Health, the Genesee County Health Department, the University of Michigan – Flint's Department of Public Health and Health Sciences, the Greater Flint Health Coalition, and the Flint Odyssey House Health Awareness Centre. The Speak to Your Health! Community Survey was approved by the University of Michigan Health Sciences and Behavioural Sciences Institutional Review Board.

The Speak to Your Health! Community Survey (see online-only Appendix 1) was administered among residents aged 18 years and older from a random sample of households (one per household) across all Genesee County residential census tracts (areas of 2½-8 thousand population) in 2009 and 2011. According to the United States Census Bureau, the county's population was 424,043 in 2009 and 421,750 in 2011.

Professional staff at the Michigan Public Health Institute conducted computer-aided telephone interviews. The 2011 respondents could also complete a hard-copy survey and return it in a self-addressed stamped envelope or complete it online survey through a secure server. The overall survey response rate of 25% was the proportion of surveys completed per all contacted households with valid addresses and phone numbers across 2009 and 2011. When asked, no participant reported having taken the survey previously. The 2,932 participants across the two waves were, therefore, unique individuals of whom 498 (17.0%) reported having children under age 18 in their households. These 498 participants all had complete data and were the basis of the present analysis.

The previously validated independent variables obtained from previous studies included: socio-demographic factors (i.e. race/ethnicity, gender, age, education, and financial distress), financial planning, fear of neighbourhood crime, stress, and experiences of discrimination (see online only Appendix 1). Sub-scale items such as "People in your neighbourhood are willing to help their neighbours" and "People in your neighbourhood can be trusted" (Sampson *et al.*, 1997) were used to calculate composite neighbourhood social capital scores. These social capital items were from a national U.S. survey of health with acceptable to high validity (Lee and Kim, 2013; Nelson *et al.*, 2001) and the sub-scale's Cronbach's alpha in this study was 0.81.

Depressive symptoms were assessed with another instrument's sub-scale items with established high validity that asked participants how often during the past week they felt: lonely; blue or sad; or had no interest in things (Derogatis, 2001). This sub-scale's Cronbach's alpha in this study was 0.89.

A composite fear of crime score was calculated using these closed response items: 1, How fearful are you about crime in your neighbourhood?; 2, How safe is it to walk around alone in your neighbourhood during the daytime?; 3, How safe is it to walk around alone in your neighbourhood after dark?; 4, Compare the crime rate in your neighbourhood to that of other neighbourhoods (BJSOCOPS, 1999).

The fear of crime measure was considered valid on account of its extensive use. In this study, the fear of crime scale had a Cronbach's alpha of 0.89.

Forward stepwise logistic regression was used to determine the statistically significant predictors of lack of visits to dental offices and unmet dental care needs in the previous year, while controlling for the other variables. Lack of visits to dentists' offices (also referred to as "not visiting any dentist") was assessed using the question: "Have all of the children under age 18 living in your household been to a dentist in the past 12 months?" Unmet dental care need was assessed with the following question: "Was there a time during the past 12 months when the children under 18 living in your household needed dental care, but could not get it because of cost?" In stepwise regression, predictor variables are determined by an automatic procedure in the form of a sequence of tests (Hocking, 1976). In forward stepwise selection, initially no variables are included in the model; then, one variable is added at a time.

Results

Among the 498 participants (mean age 43 years) reporting household children, most were female and non-Latino White (Table 1). The sample mean was 13.8 years of education and 149 (29.9%) reported that not all of their household children had been to a dentist in the past year. A total of 64 participants (13.0%, mean age 39.9) reported that their household children needed dental care but could not receive it because of cost and they tended to report more depressive symptoms, stress, and discrimination than the sample means.

Adults who reported higher depressive symptoms, lower neighbourhood social capital, greater financial distress, and were younger were at an increased likelihood of having household children who did not visit any dentist in the past year (Table 2). Depressive symptoms, lower neighbourhood social capital, and greater financial distress accounted for 7.3% in the variance in the lack of visits to dentists' offices among children. Once these factors were accounted for, participant's gender, race/ethnicity, educational level, financial planning, stress, fear of neighbourhood crime, and experiences of discrimination did not account for a significant variance in not visiting any dentist among children.

Participants' gender, minority status, educational level, financial planning, stress, fear of neighbourhood crime, experiences of discrimination, depressive symptoms, and social capital were not associated with children's unmet dental care needs. Financial distress was the only significant predictor of children's unmet dental care needs. It accounted for 7.7% of the variance in children's unmet dental care needs.

Table 1. Descriptive characteristics of all participants with at least one child and those who also could not receive care because of cost

Categories	Characteristic or format of statistic	Summary Statistics for participant adults with at least one child, n=498	Summary Statistics for participants with children who could not receive care because of cost, n=64
Gender, n (%)	Female	389 (78.1%)	84.6%
	Male	109 (21.9%)	15.4%
Age, years	Mean, SD (range)	42.8, 11.9 (18 to 95)	39.9, 10.62 (21 to 64)
Race/ethnicity, n (%)	Non-Latino White	316 (64.2%)	48.0%
	Other	176 (35.8%)	52.0%
Education, years	Mean, SD (range)	13.8, 2.4 (10 to 20)	12.1, 22 (10 to 16)
Depressive symptoms	Mean, SD (range)	2.1, 1.0 (1 to 5)	2.8, 1.3 (1 to 5)
Fear of crime	Mean, SD (range)	2.1, 0.8 (1 to 4.25)	2.7, 0.8 (1.2 to 4.0)
Stress	Mean, SD (range)	2.9, 1.0 (1 to 5)	3.2, 1.2 (1 to 5)
Financial distress	Mean, SD (range)	2.7, 0.9 (1 to 5)	3.9, 0.9 (2.7 to 5)
Experienced discrimination	Mean, SD (range)	1.7, 0.7 (1 to 4)	2.2, 0.8 (1 to 4)
Social Capital	Mean, SD (range)	3.0, 0.7 (1 to 5)	3.2, 0.9 (1 to 4.8)
Lack of visits to dentist among child(ren)	Yes	149 (29.9%)	29.6%
	No	349 (70.1%)	70.4%
Unmet dental care needs among child(ren)	Yes	64 (13.0%)	
	No	430 (87.0%)	

Table 2. Statistically significant predictors of children's lack of visits to dentists' offices based on results of forward stepwise logistic regression, n=498

	Unstandardised Coefficients		Standardised Coefficients	T	p
	B	SE	Beta		
(Constant)	1.158	0.139		8.317	0.001
Depressive Symptoms	-0.063	0.022	-0.143	-2.888	0.004
Social Capital	-0.096	0.029	-0.15	-3.283	0.001
Financial Distress	-0.073	0.026	-0.143	-2.867	0.004
Age	0.004	0.002	0.091	2.032	0.043

Race/ethnicity, gender, education, financial planning, fear of neighbourhood crime, stress, and experiences of discrimination were also included in the model; these factors did not predict lack of visits to dentists' offices.

Discussion

The influences of previously studied and novel factors on two dependent variables, specifically not visiting any dentist and unmet dental care needs in a mid-western county in the United States were assessed. Caregivers' financial distress, depressive symptoms, and limited social capital were barriers to children's dental care. Financial distress was associated with both dependent variables. Future research should investigate whether financial distress contributes to an increased likelihood of developing paediatric dental caries in Genesee County.

The finding of the association between financial distress and the two dependent variables is notable because dental care coverage is available for the underserved through the HKD programme in Michigan. Future research should investigate the reasons why parents with freely available dental care for their children may not access such care. Factors that may contribute to the lack of dental use despite the availability of the HKD programme may include low oral health literacy and transportation barriers to visiting dental offices. In addition, access to HKD dentists can be complicated. Dentists must verify HKD eligibility on the day of treatment. Many private dental practices avoid scheduling HKD-covered children at the beginning of the month when eligibility cannot be confirmed through the state's online system. Although listed as participating dentists, some dentists limit the number of HKD children they accept into their practice. Some dentists exhibit a bias against HKD-covered children due to the high number of no show appointments.

The finding on the association between social capital and not visiting a dentist is consistent with most prior research. In US low-income neighbourhoods having more churches in a neighbourhood was associated with decreased severity of dental caries among African American preschool children (Tellez *et al.*, 2006). In a 2003 U.S. national survey higher social capital was associated with better oral health among 1-5-year-olds (Bramlett *et al.*, 2010). Parents in neighbourhoods with high social capital may have neighbours encourage dental visits and offer information on safety net clinics (Iida and Rozier, 2013). Safety net dental clinics are facilities, providers, and payment programs that support access to dental care for underserved populations including those individuals disadvantaged by a variety of social, economic, and health conditions.

The present findings suggest that children are dependent on their parents' emotional well-being. In a prior study testing a conceptual framework on the child-, family- and community-level influence on young children's oral health, poor parental mental health was associated with worse reported oral health (Fisher-Owens *et al.*, 2007; Keeter *et al.*, 2000). Future research should investigate the reasons why depressive symptoms may lead to the lack of dental care and subsequently poor dental health. Dental anxiety may be one mediating variable in the association between depressive symptoms and dental care. In addition, parents with depressive symptoms may be less engaged in the well-being of their children in general.

The study's 25% response rate might be considered a limitation, however, it is within the range of many other uncompensated surveys (Holbrook, 2008) and responses to substantive variables appear to vary little with response rates (Keeter *et al.,* 2000). Another limitation is that causal and temporal associations could not be assessed in this cross-sectional study. The Genesee County sample may not be generalised to other populations as access programs, funding regimes and services vary geographically so future research could examine the influence of low social capital and depressive symptoms on dental care in areas with other arrangements. All variables were self-reported. Although depressive symptoms are indicators of people's quality of life, they may not be generalised to clinical depression. Another limitation is that the study did not assess the influence of the independent variables on the type of dental care, such as primary, secondary, or tertiary preventive care that children received.

The significant predictors explained a relatively small amount of the variance in the outcome variables. Other variables, which were not included in the survey may help explain more of the variance, e.g. parental knowledge about the importance of visiting the dentist, parental perceived need to visit the dentist, children's dental care habits such as brushing and flossing, and children's dental problems such as caries. The survey also did not include questions on parental knowledge of and experiences with the HDK programme and any transportation barriers to reaching dental offices.

One strength of the study is the community-representative large sample, which allows generalising the findings county-wide. The use of multivariable regression analysis is a strength because financial distress, social capital, and depressive symptoms were predictors even when adjusting for confounding variables. Instead of using variables on social capital and discrimination at the neighbourhood level that may not be representative of the individual, the study used individual-level variables. The use of multi-component scales with high validity and reliability measures to assess fear of crime, social capital and depressive symptoms was another strength. Dental care is an essential component of health care, as recognised by the creation of the HKD programme. Higher depressive symptoms, lower neighbourhood social capital, and younger age were associated with not visiting a dentist in the past year. It is important that dental health interventions take into account risk factors such as depressive symptoms and low neighbourhood social capital. Programmes that help women provide food for themselves and their children might usefully consider promoting parental mental health and social capital possibly through organising social support clubs which can discuss the importance of regular dental visits, recommend local dentists and provide transport to dental offices.

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