



Does the promotion of community social capital reduce obesity risk?

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ARTICLE INFO

Article history:

Received 23 November 2009

Received in revised form 19 January 2011

Accepted 30 January 2011

JEL classification:

I12

I18

Z13

Keywords:

Social capital

Obesity

Physical activity

Diet

Schooling

Prevention

ABSTRACT

We explore whether higher levels of community social capital reduce the likelihood of being obese in the U.S. adult population. We also examine whether this relationship may differ by levels of schooling. Data come from the 2001 to 2005 Behavioral Risk Factor Surveillance System for all 50 U.S. states and the District of Columbia, and are augmented with a validated measure of community social capital, the Petris Social Capital Index. We find that greater community social capital reduces adult obesity risk, and has a larger effect on persons with more schooling. Social capital affects obesity through the promotion of weight-control efforts.

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1. Introduction

Epidemiological research has revealed an increasing prevalence of obesity in the U.S. population which doubled between 1970 and 2000 (Flegal et al., 2002; Cutler et al., 2003). In the late 1990s and 2000, approximately 30% of adults were reported as being obese (Flegal et al., 2002; Cutler et al., 2003; Chou et al., 2004). The growing obesity prevalence is a major public health concern due to its association with adverse health outcomes and the associated medical and non-medical costs (Thompson et al., 1999). Obesity has been linked to an increased risk of diabetes, high blood pressure, high cholesterol, asthma, arthritis, overall poor health status, and early mortality (Allison et al., 1999; Fontaine et al., 2003; Mokdad et al., 2003; Peeters et al., 2003). Expenditures related to being obese or overweight made up approximately 9.1% of total U.S. health care expenditures in 1998, or approximately \$92.6 billion (2002 dollars) (Finkelstein et al., 2003).

Increases in both the medical and non-medical costs attributable to obesity are not borne solely by obese individuals. A significant portion of treatment costs attributable to obesity

are borne by local, state, and federal governments as well as by businesses. For example, lost productivity due to obesity affects firms through absenteeism, reduced performance, and increased health insurance expenditures (Runge, 2007). The estimated direct economic costs of obesity to U.S. business in 1994 were about \$10 billion, mostly due to larger health insurance premiums (Thompson et al., 1998). The indirect costs attributable to obesity-related loss of productivity were estimated to be \$47 billion (1995 dollars).

Given existing evidence on the implications of rising obesity rates for individuals and society, the potential health and economic benefits from reducing obesity rates are considerable. Advocates have explored and suggested strategies that may be useful for reducing obesity in the general population. Conspicuously, however, there has been little discussion about characteristics of the broader social environment which may not only provide the conditions for the successful implementation of strategies to reduce obesity, but may also have independent obesity-reducing effect of their own.

This study explores a potential strategy for countering the obesity epidemic. We examine the obesity-reducing effect of community social capital (henceforth, CSC). CSC refers to community-level resources such as the density of social networks that facilitate cooperative actions for mutual benefit among members of a community (Paldam, 2000; Ferlander, 2007). We

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hypothesize that increases in CSC lead to behavioral changes such as reduced caloric intake and increased exercise by, for example, facilitating flows of health-related information, and in turn reduce an individual's likelihood of being obese.

We also examine the effect of schooling as an important individual-level factor that may modify the potential effect of CSC on individual behavior. Schooling may enhance the effectiveness of CSC through the efficient production of health and the facilitation of social engagement (Grossman, 1972; Kenkel, 1991; Helliwell and Putnam, 1999). We thus hypothesize that CSC has a larger obesity-reducing effect for persons with higher levels of schooling.

2. Background

2.1. Determinants of obesity risk

Calorie consumption reportedly is largely responsible for the increasing incidence of obesity (Yach et al., 2006). Growing portion sizes, the greater availability of fast-food and full-service restaurants and lower food prices have been related to the increased calorie consumption and obesity prevalence (Cawley, 1999; Young and Nestle, 2002; Chou et al., 2004; Finkelstein et al., 2005). An increase in maternal employment and technological innovations add to the list (Philipson and Posner, 1999; Lakdawalla and Philipson, 2002; Anderson et al., 2003; Finkelstein et al., 2005). For example, time-constrained mothers make more use of highly convenient, but high calorie/high fat foods (Anderson et al., 2003). Advancements of innovative technologies that realize economies of scale and enable the mass preparation of food would lower the time price of food preparation and consumption, and in turn increase the frequency of high-calorie food consumption (Cutler et al., 2003).

Factors affecting changes in energy expenditure also provide plausible explanations on rising obesity. For example, maternal employment may increase children's likelihood of being overweight by reducing the overall physical activity of children (Anderson et al., 2003). Technological innovations in the form of labor saving devices may reduce physical activity at the home and the work place (Philipson and Posner, 1999; Lakdawalla and Philipson, 2002). Unemployment status was related to increased participation in physical activity (i.e., exercise) and the subsequent reduction in obesity rates (Ruhm, 2000).

Whatever the relative importance of these factors in explaining rising obesity risk in the population, most studies are implicitly or explicitly grounded in the conceptual framework that weight changes are a function of the energy balance between caloric intake and energy expenditure, postulating that weight is gained when calories consumed are larger than energy expended (see, for example, Philipson and Posner, 1999; Cutler et al., 2003; Chou et al., 2004).

2.2. Strategies to fight obesity

A number of interventions focused on the high-risk segments of the population, and tested whether they produced behavioral changes that result in individual weight reduction. For example, randomized controlled studies reported that interventions on high-risk family reduced the risk of overweight and obesity (Epstein et al., 1990, 1994). Nevertheless, the overall effectiveness is inconclusive due to the small number of controlled studies, limits in study designs, and inconsistent outcome measures and follow-up periods (Müller et al., 2001).

Community-wide interventions seek to alter consumers' diet and lifestyle choices through worksites, community classes, broader prevention efforts, the mass media, and regulations. Some community-based strategies, such as the North Karelia Project

(Puska et al., 1985), the Stanford Five-City Project (Taylor et al., 1991), and the Minnesota Heart Health Program (Jeffery et al., 1995), integrate obesity prevention into community-based programs aimed at the prevention of cardiovascular disease, although none were effective with regard to weight loss.

Mandatory nutrition labels in restaurants and restricting food advertising, especially to children, attempt to change the information consumers are exposed to. However, mandatory menu labeling in general has not been found to reduce calories consumed (Elbel et al., 2009). In addition, critics are concerned that mandatory labeling could lead to unintended consequences such as food reformulations (i.e., restaurants opt to reduce saturated fat but instead increase the sugar content of foods to compensate for flavor change) and price promotions of nutritionally inferior food brands (i.e., companies compete on price, potentially lowering food prices and increasing the quantity demanded of high calorie foods) (Kuchler et al., 2005).

Creating economic incentives by imposing higher taxes on unhealthy foods has been suggested as a potentially viable option to discourage high-calorie or high-fat food consumption (Jeffery et al., 1994; Battle and Brownell, 1996; French et al., 1997, 2001). However, there is concern that high prices lower consumer welfare in the short run and the resulting welfare loss may be greater among the elderly and poor due to the regressive nature of the so-called "fat tax" (Chouinard et al., 2005). Consumers may also substitute other unhealthy foods for high-tax foods (Kuchler et al., 2005).

As evidenced, there are many forms of interventions and proposals to combat obesity and a need for research to evaluate the strengths and weaknesses of each option. Missing from the list of options, however, are changes in the broader social environment that may promote or support interventions or policy proposals aimed to influence an individual's choices on diet and exercise. As stressed by Müller et al. (2001), obesity prevention may be effective when interventions are combined with supportive environments.

2.3. The promotion of CSC as a potential strategy to combat obesity

The concept of social capital is multifaceted, but most definitions comprise "social networks, norms of reciprocity and social trust which facilitate co-ordination and co-operation among individuals for mutual benefit" (Ferland, 2007). There are at least two levels of social capital. At the individual level, social capital can be described as the level of trust, social connection, and cooperation that an individual has in/with a given community. At a more collective level, social capital can be defined as the density of trust, networks, or cooperation within a given community (Paldam, 2000). Social capital can be further broken down into cognitive and structural components. The cognitive aspect of social capital is characterized by values, trust, and beliefs that produce reciprocity. The structural component of social capital refers to resources such as a wide variety of networks that produce cooperative actions (Uphoff, 2000; Ferlander, 2007).

Following Woolcock (1998), we distinguish "what social capital does" from "what social capital is". We are also interested in the supply of social capital provided at the collective level. Thus, in this study, we focus on structural CSC. The strength of CSC is that it represents the supply side of social capital and is more amenable to policy interventions than any other forms of social capital, such as cognitive social capital.

The close relationship between CSC and health outcomes/behaviors is well-documented, including favorable general health outcomes (Cullen and Whiteford, 2001), reduction of psychological distress or poor mental health (Araya et al., 2006; Kim and Kawachi, 2007; Scheffler et al., 2007), and smoking (Brown

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