

## THE PRESENT AND FUTURE

### STATE-OF-THE-ART REVIEW

# Family-Based Approaches to Cardiovascular Health Promotion



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#### ABSTRACT

Cardiovascular disease is the leading cause of mortality in the world, and the increasing burden is largely a consequence of modifiable behavioral risk factors that interact with genomics and the environment. Continuous cardiovascular health promotion and disease prevention throughout the lifespan is critical, and the family is a central entity in this process. In this review, we describe the potential rationale and mechanisms that contribute to the importance of family for cardiovascular health promotion, focusing on: 1) mutual interdependence of the family system; 2) shared environment; 3) parenting style; 4) caregiver perceptions; and 5) genomics. We conclude that family-based approaches that target both caregivers and children, encourage communication among the family unit, and address the structural and environmental conditions in which families live and operate are likely to be the most effective approach to promote cardiovascular health. We describe lessons learned, future implications, and applications to ongoing and planned studies. (J Am Coll Cardiol 2016;67:1725-37) © 2016 by the American College of Cardiology Foundation.

Cardiovascular disease (CVD) is the leading cause of mortality in the world (1,2), and the incidence of CVD in the United States continues to rise, largely as a consequence of risk factors modifiable by changes in behavior (3). Behavioral risk factors in early childhood, such as physical inactivity and unhealthy diet, contribute significantly to childhood obesity (4,5), which, in turn, is related to increased risk of developing CVD risk factors, such as diabetes, hypertension, and dyslipidemia, ultimately resulting in increased risk of atherosclerotic CVD (6-8). Conversely, improving cardiovascular health from childhood onward can have lifelong positive effects (9-12). Because our behaviors as adults

are linked to exposures and critical periods during childhood, there is a need for continuous cardiovascular health promotion and disease prevention throughout the lifespan, involving all ages and stages of family life (13,14).

Because parents clearly influence their children's life-styles, the health status of the parent is intricately linked to that of their children. Numerous studies show a strong association of parental obesity with obesity in their children (5,15-17). It follows, therefore, that prevention of childhood obesity should include efforts aimed at the parents. Indeed, studies have shown that family-based approaches to cardiovascular health promotion can have beneficial

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From the Icahn School of Medicine at Mount Sinai, New York, New York. Dr. Vedanthan is supported by the Fogarty International Center of the National Institutes of Health (K01TW009218). The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health or the American Heart Association. Drs. Kovacic and Björkegren are supported by the National Heart, Lung, and Blood Institute (K08HL111330 and R01HL125863, respectively), Foundation Leducq Transatlantic Network of Excellence Awards, and AstraZeneca. Dr. Fuster is supported by the National Heart, Lung, and Blood Institute (5U01HL114200). Drs. Vedanthan, Bansilal, Soto, Kovacic, Latina, Kasarskis, Hajjar, Schadt, Björkegren, Fayad, and Fuster, Ms. Jaslow, and Ms. Santana are supported by the American Heart Association (14SFRN20490315). Dr. Gorga has reported that he has no relationships relevant to the contents of this paper to disclose. Deepak Bhatt, MD, served as Guest Editor for this paper.

Manuscript received October 26, 2015; revised manuscript received December 22, 2015, accepted January 3, 2016.

## ABBREVIATIONS AND ACRONYMS

**CAD** = coronary artery disease

**CVD** = cardiovascular disease

**DNA** = deoxyribonucleic acid

**GWA** = genome-wide  
association

effects on both children and parents (18-22). These findings have been replicated in low- and middle-income countries, and in low-resource settings in high-income countries as well (23,24). In addition, school-based programs tend to have relatively greater benefit when parent/caregiver participation is an integral component of the intervention (25-27). Finally, increasing evidence demonstrates that interventions targeting children may have beneficial spillover effects for parents and caregivers (28). The family is therefore a linchpin for cardiovascular health promotion throughout the life course.

In this review, we describe a potential rationale and mechanisms for these observations. Specifically, we focus on: 1) mutual interdependence of the family system; 2) shared environment; 3) parenting style; 4) caregiver perceptions; and 5) genomics (Figure 1). Because a substantial number of children live with caregivers who are not their biological parents, we have elected to use the term “caregiver” in this paper whenever appropriate.

## MUTUAL INTERDEPENDENCE OF THE FAMILY SYSTEM

**FAMILY AS A SYSTEM.** The family is a complex system, where the family members interact to influence each other in a reciprocal fashion. Effective interventions to produce changes in behavior require insight into family dynamics and mutual interdependence of the family system. There are several different theories of family process and function; an exhaustive review is beyond the scope of this paper, but we draw upon several of them to provide insights into family-based approaches to cardiovascular health promotion (Table 1).

The Family Systems Theory proposes that the family is a complex social system where elements are interconnected, yet the system is best viewed as a whole, interacting with the environment (29). There are subsystems, such as sibling interactions and caregiver-child interactions, which can influence the whole system. In addition, a change in an individual’s role can initiate a change in other family members. Although a substantial number of childhood obesity interventions have focused on parent-child dyads, it is likely that engaging the entire family may be more effective at cardiovascular health promotion (30,31).

**FAMILY COHESION AND COMMUNICATION.** Family cohesion, flexibility, and communication are also important for the development and sustenance of healthy behaviors, as described by the Circumplex

Model (32). Separation and connection should be balanced among family members, such that there is a healthy blend of individuality and independence, in combination with emotional closeness and loyalty (30). Families that exhibit this type of balance are more likely to be able to set and achieve goals, such as maintaining an active life-style, whereas unbalanced families may struggle with adherence to treatment (30,32). For instance, disruptive home environments with conflict generally have less cohesive families, and this has been shown to be associated with an increased risk of obesity among children (33). In addition, lower family cohesion and adaptability have been associated with adolescent overeating (34). Conversely, some prevention intervention programs that affect the parent-child relationship, the relationships between a child and his/her peers, and the relationship between a child and the media have shown an association with more positive outcomes with regard to eating disorders and body dissatisfaction (35). It is important to note, however, that children living in single-parent families exhibit no significant difference in physical activity levels relative to children from 2-parent families (36).

In addition, families who do not communicate effectively will also face challenges and may not achieve their goals. In contrast, individuals from families who discuss diet and physical activity are more likely to have a healthy diet and be physically active (37). Communicating respect was noted to be an important component that was associated with positive influences on healthy diet and activity. Family members who feel valued and respected in the conversation are more likely to be positively influenced with respect to attitudes and behaviors. Social influence is mutual and interdependent in the family system, and caregivers can also be influenced by children. For example, children’s healthy attitudes towards diet and physical activity can influence a mother’s health-related behaviors (37).

**COPING WITH STRESS.** Finally, how families cope with and adapt to stress can predispose toward the adoption of unhealthy behaviors (38-40). In the double ABCX model, the event (A), the family’s resources (B), and the family’s perception of the event (C) all play a part in determining the family’s response to a crisis (X) (38). A family may respond to stressful events by developing unhealthy habits, such as poor nutrition and sedentary behavior. Parents who are under significant emotional stress, such as those experiencing depression or anxiety, are unlikely to be able to support their children in changing behaviors (41). In particular, maternal depression

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