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Understanding the influence of urban- or rural-living on cardiac patients' decisions about diet and physical activity: Descriptive decision modeling

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ABSTRACT

Background: It is challenging to assist people to attend to risk factors for coronary artery disease (CAD). There is potential for cultural elements associated with place of residence (i.e., urban- or rural-living) to have an effect on peoples' decision-making about managing CAD risk.
Aim: To better understand patient's decision-making processes regarding having a heart-healthy diet and engaging in regular physical activity (major CAD risk factors), and the potential influence of urban- or rural-living.
Methods: Based on a previous series of qualitative interviews with 42 cardiac patients (21 urban-living, 21 rural-living), hierarchical decision-models regarding eating a heart-healthy diet and engaging in regular physical activity were developed, and a survey based on the decision-models generated. The models were then tested for 'fit' with another group of 42 cardiac patients, and were revised to make them more parsimonious. The final models were tested with a novel group of 647 CAD patients from Alberta, Canada (327 urban-living, 320 rural-living). The primary analysis was focused on determining the extent to which patients completing the survey fell in the correct behavioral group. Thereafter individual nodes were examined to determine decision-making constructs that were different between urban- and rural-living patients.
Results: When tested, the models had overall accuracy of 93.5% for diet and 97.5% for physical activity. The most salient model nodes that led to differing behavioral outcomes reflected these constructs: perception of control over health; time, effort, or competing priorities; receipt of appropriate information; and appeal of the activity.
Conclusions: This information is potentially useful to assist healthcare providers to: (1) understand patients' decisions regarding their cardiac risk factor modification behavior, and (2) better direct conversations about risk factor modification and educational activities.

What is already known about the topic?

- Diet and physical activity can play a central role in people's risk for coronary artery disease.
- Culture plays an important part in how people make decisions regarding their health behavior.
- Urban- or rural-living people can be considered part of differing cultures.

What this paper adds?

- Perception of control over health affects behavior and varies by place of residence.

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- Receipt of instructional information enhances heart healthy behavior in urban- but not rural-living people.
- Competing priorities is a universal construct in making decisions about enhancing heart healthy behaviors.

1. Introduction

1.1. Cardiovascular disease care

Cardiovascular disease (CVD), of which coronary artery disease (CAD) is a major contributor, is a leading cause of death for men and women in most industrialized nations. It is also associated with large healthcare expenditures, and has a major negative impact on quality of life (European Heart Network, 2012; Public Health Agency of Canada, 2009; Roger et al., 2010). Much of the focus for care of cardiac patients is on improving in-hospital acute care and enhancing the use of evidence-based therapies. However, a greater challenge lies in improving outcomes through risk factor management once patients leave the acute setting and return to their community environments. Eating a diet characterized by high levels of saturated fat, cholesterol and sodium and physical inactivity are major modifiable risk factors for CAD (Katzmarzyk and Janssen, 2004; Khan et al., 2008). When people engage in risk factor reduction behaviors, the incidence of acute coronary events and the need for revascularization procedures are reduced, survival is extended, and quality of life is improved (Public Health Agency of Canada, 2009).

1.2. Urban- and rural-living

Culturally based factors influence peoples' beliefs about health and making lifestyle changes associated with disease prevention and risk reduction. Culture (including that associated with urban- and rural-living) influences wellbeing and how this influence occurs ought to be better understood (Health Canada, 1999). A significant proportion of industrialized nations' populations are rural-living. For example, approximately 20% of the North American population is rural-living (Statistics Canada, 2006; United States Census Bureau, 2010), while European Union countries have 10–60% of their populations living in rural areas (European Foundation for the Improvement of Living and Working Conditions, 2006).

Previous work from our group has revealed differences in factors that influence urban- versus rural-living peoples' approach to their CAD (King et al., 2006). For example, rural-living people often believed that they were less likely than urban-living people to succumb to CAD; perceiving that the nature of the environment in which they lived was healthier and their daily work more physically strenuous. Though often living long distances from friends and family, rural-living people also identified more and stronger sources of social support (a known mediator of CAD development and outcomes; King and Colella, 2008) relative to their urban-living counterparts. Finally, rural-living people relied strongly on developing relationships with their healthcare providers (particularly the local pharmacists). Their access to specialist care and cardiac rehabilitation programs were limited relative to those living in urban environments. Thus, the potentially unique CAD health decision-making factors associated with living in an urban versus rural environment, should to be revealed.

1.3. Cardiac patients' behavior decisions

Cardiac patients make day-to-day decisions about risk factor reduction behaviors such as how to eat or whether to engage in physical activity (Barlow et al., 2002). Kearney and O'Sullivan (2003) contended that most health behavior models have limitations due to "untapped influences that persist in thwarting successful behavior change" (p. 136). These influences emanate from people's own appraisal of situations, or their explanatory models. If healthcare providers are aware of the basis for CAD patients' health behaviors (e.g., their explanatory models), they can more effectively assist patients to make healthcare choices (Kleinman, 1995). A beginning step in effectively assisting CAD patients to make good decisions about their risk factor reduction, is thus to understand *how* they make health related choices.

1.4. Decision-models

Decision-models are generally described as either normative or descriptive. When using normative decision modeling, the investigator aims to determine how people *should* make choices to reach an *optimal* decision. Using descriptive decision models on the other hand, enables the investigator to learn about the reasoning process that leads people to, or *how* they reach, their *own* decision (Abelson and Levi, 1985; Garro, 1998; Ogden, 2003; Tversky, 1972; Tversky and Kahneman, 1981). Ethnographic decision-modeling (Gladwin, 1989), a type of descriptive decision modeling, has been used primarily by anthropologists (Quinn, 1978; Gladwin et al., 2001; Mathews and Hill, 1990; Ryan and Martinez, 1989; Bauer and Wright, 1996; Hurwicz, 1995; Hurwicz and Berkanovic, 1991), but also by researchers in health disciplines (Montbriand, 1995; Oh and Park, 2004; Beck, 2005; Breslin et al., 2000) to describe and predict group behavior when individuals are making the decisions. Its mixed methods nature renders descriptive decision-modeling an excellent tool for better-understanding *how* patients make choices about their health and healthcare and enables validation of the decision process. Thus, using descriptive decision-modeling, we aimed to better understand, from the perspective of urban and rural-living CAD patients, the factors that influence their decision-making in the management of two prominent cardiac risk factors: adhering to a heart healthy diet and engaging in regular physical activity. By doing so, healthcare providers will be better able to understand the patients' decision-making processes and direct conversations about what leads people to attend to (or not) these important risk factors more appropriately.

2. Methods

We used a three-staged, multi-methods approach to develop and examine a descriptive decision-model that