IIE TRANSACTIONS ON HEALTHCARE SYSTEMS ENGINEERING
2016, VOL. 6, NO. 2, 55–64
http://dx.doi.org/10.1080/19488300.2015.1126872

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Using the health belief model to examine the effect of educational programs on individual protective behaviors toward seasonal influenza

Elnaz Karimi, Ketra Schmitt, and Ali Akgunduz

Concordia University, Montreal, Quebec, Canada

ABSTRACT

The purpose of this study is to use Health Belief Model (HBM) concepts to predict public's intentions to develop protective behaviors toward seasonal influenza (vaccination and social-distancing) and to explore the effect of education (awareness) programs on individual's protective behaviors. In order to study individual's behaviors toward developing protective strategies against seasonal influenza, two groups of undergraduate students with similar demographic and educational backgrounds were studied. The first group (control) represented the behavioral patterns of participants, based on their general knowledge of influenza and its interventions while the second group (treatment) represented the behavioral patterns of participants who have been educated by a healthcare expert. The results suggest that educational programs or information distributions which provide sufficient information to increase individuals' perceived susceptibility toward influenza, and also provide them with enough information on influenza vaccination, its efficiency, its low potential side effects and its availability, could increase the rate of the development of these efficient protective behaviors among students. Our work indicates that educational programs which focus on susceptibility to the influenza virus and the perceived benefits and perceived barriers of social distancing will have a better effect on increasing the rate of social distancing among students.

ARTICLE HISTORY
Received November 2013
Accepted November 2015

KEYWORDS
experiment; health belief model; individual behavior; influenza; multivariate regression

1. Introduction

Influenza outbreaks occur every year, but the timing, severity, and duration vary from season to season. Although fever, fatigue, aching muscles and cough are the most common consequences of catching the flu virus, it continues to have a considerable annual health and economic impact ($87 billion/year in United States; Molinari *et al.*, 2007), through work loss, hospitalizations and deaths. Seasonal influenza attack rates vary from 10% to 30% in adults and 20% to 50% in children (Neuzil *et al.*, 2002) Influenza spreads easily from person to person. An infected person can spread the influenza virus even before the symptoms appears. Given the constant genetic changes of influenza virus and the easy transmission of the virus, the need to prevent an outbreak is paramount. Many mathematical modelling and simulation tools have been developed to evaluate various strategies including influenza interventions, and to control an influenza outbreak. However, many of these models fail to incorporate the self-initiated protective behaviors of individual toward influenza and strategies that could help to improve these behaviors. Despite such behaviors can have a significant impact on the spread of infectious disease, their mathematical or statistical representations in the modeling of influenza transmission has not received sufficient attention in the literature (Mao, 2011; Funk, Salathé, and Jansen, 2010). Two of the most common ways of controlling an outbreak of infectious disease such as influenza are vaccination and social distancing. Since the influenza virus transmits through physical contacts, reduction of physical contacts (social distancing) between individuals would significant impact on the attack rate during an outbreak.

A hallmark of educational experience is the frequent interactions between students which can lead to a high attack rate not only in school but also in student and teacher households. Occurrence of outbreak in schools causes a significant increase in student health care visits, medication usage, absenteeism and work loss (Dalton, Durrheim, and Conroy, 2008) Given their high attack rates, schools are an ideal place for the development of interventions and health promotion programs to prevent influenza outbreak, which can lead to an increase in community immunization coverage (Heymann *et al.*, 2004) Delivering such programs in schools can also alleviate many of the common barriers of community-based treatments, such as time, location, transportation and cost (King *et al.*, 2006).

Many psychological models have been proposed to explore human behavioral change toward an infectious disease. These models could provide a relatively comprehensive understanding of the effect of psychological, social, economic and environmental factors on individual health behavior. Glantz, Rimer, and Viswanath (2008) proposed Health Belief Model (HBM), Theory of Reasoned, Action/Planned Behavior, Social Cognitive Theory and the Transtheoretical Model to be the four most commonly used psychological models for this purpose (Glanz *et al.*, 2008) Multiple studies have provided evidence that using such models in developing health educational programming can lead to more effective strategies to employ behavioral change for different diseases such as HIV, chronic diseases and influenza (Ammerman, *et al.*, 2002; Holtgrave *et al.*, 1995; Fisher and Fisher, 2000; Painter *et al.*, 2010).

HBM is the most commonly used technique to study the health-related behaviors. HBM suggests that when individuals

CONTACT Ketra Schmitt kschmitt@encs.concordia.ca Concordia University, Montreal, Quebec, Canada.