

Effective Methods for Lifestyle Modification

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Introduction

This paper will discuss the known evidence regarding alteration of health risk behaviors. Before embarking on this endeavor of risk behavior change, it is important to identify the relationship of lifestyle-related risk behaviors to disease within a society and understand that the reduction of specific risk factors is important to the health of that society. Specifically within Korea, why is it important to focus on assisting individuals and communities to reduce the risk of certain behaviors associated with disease outcomes, and which behaviors should be approached? How can health professionals facilitate this change and reduce the practice of behaviors that pose a risk to health?

To address these questions, it is first important to understand the theories that have been proposed to explain why people behave in the manner they do. These theories provide the basis for investigating models of successful behavior change programs within a society and how these might be applicable to future needs of a society. The two examples of behavior change programs that this paper will focus on are tobacco control and prevention, and the promotion of healthy nutrition and physical activity. Tobacco is an area where successes have been well documented and thoroughly evaluated worldwide. In contrast, improving nutrition and physical activity has to date been less than successful, but many of the principles applied to tobacco may be successful if widely implemented toward these other health behaviors. The paper will then conclude with strategies that primary care practitioners can and should be implementing to prevent chronic disease

Leading causes of mortality

According to the World Health Organization (WHO), the top 10 causes of death (Table 1) for both men and women in the Republic of Korea include cerebrovascular disease, lung cancer, liver cancer, stomach cancer, is chemic heart disease, chronic obstructive pulmonary disease (COPD), diabetes mellitus, and suicide/self-injury. In addition, among the top 10 causes for males are chronic liver disease and cirrhosis, and motor vehicle accidents. For females, hypertensive disease and mental disorders complete the top 10 causes of death (WHO, 2005, <http://www.who.int/healthinfo>).

Relationship of mortality causes to behavioral risk factors

Of the current leading causes of mortality in Korea, none are communicable diseases caused by infection. The majority of these causes of mortality are chronic diseases (i.e. cerebrovascular disease, cancer, ischemic heart disease, COPD, and diabetes mellitus). Negative health behaviors, such as such as tobacco use, alcohol abuse, physical inactivity, and overnutrition, contribute to chronic disease incidence and mortality.

Of the top causes of death in Korea, tobacco use is a demonstrated risk factor for cerebrovascular disease, lung cancer, stomach cancer, ischemic heart disease, COPD, and hypertensive disease. Alcohol use is a risk factor for the chronic diseases liver cancer and chronic liver disease/cirrhosis. Physical inactivity, poor diet, and obesity are risk factors for cerebrovascular disease, cancer, ischemic heart disease, diabetes mellitus, and hypertensive disease (Ezzati, Lopez, Rodger, Vander Hoorn, Marray, et al., 2002). While many behaviors serve as risk factors for chronic disease, including substance abuse, unsafe sexual practices and subsequent sexually transmitted infections, and poor glycemic control among diabetics, this paper will focus on tobacco use, physical activity, poor diet, and obesity, as each of these risk factors contribute to the incidence of at least five of the 10 leading causes of mortality in the Republic of Korea. Understanding the prevalence of practice of these risk factors among Korean adults is important to preventing chronic disease morbidity and mortality.

Rates of behavioral risk factors

Tobacco use. Cigarette smoking is very prevalent among Korean men, with one of the highest smoking rates in the world (Kang, Kim, Park, Jee, Nam, et al, 2005). According to data collected by the Korean Ministry of Health & Welfare in 1999, 35.1% of the Korean population considered themselves to be smokers. While only 4.6% of women smoked, 67.8% of men reported smoking. Among those that smoked, 34.9% reported smoking a half pack or less per day, 55.2% smoked about a pack a day, and 10% reported smoking more than one pack a day. Of the men that do not smoke, the majority have smoked in the past; only 45% of non-smoking men report never smoking (Ministry of Health and Welfare, <http://mohw.go.kr/>).

Physical activity. Occupational physical activity has decreased in recent decades in Korea, as the economy has shifted from a primarily agricultural economy to a primarily service economy (Lee & Sobal, 2003). While a large proportion of Koreans have historically lived in rural areas, less than 10% of the population was rural by the late 1990s (Ju, 2000). Physical activity for transportation has also greatly decreased, as the number of personal cars has increased over time, with an especially high rate of increase since 1990 (Lee & Sobal, 2003; Kim, 2004).

Self-reported physical activity prevalence data was obtained in the 1998 Korea National Health and Nutrition Survey. Participants were asked the question, "How often and how long did you exercise each week during the last month, on average?" Participants were then categorized according to the responses into regular exercisers (at least 3 days per week for 20 minutes at a time), occasional exercisers (less than 3 days per week), or no exercise. A total of 84.1% of men and 90.0% of women were categorized as no exercise, while 7.4% of men and 3.6% of women were occasional exercisers, and 8.5% of men and 6.4% of women were heavy exercisers (Kim, Suh, & Choi, 2004).

Nutrition. The Korean diet has changed from a traditional diet that was predominantly starch-based, high in foods such as cereals, rice, roots, and vegetables, to a diet that contains a high proportion of animal products and a large increase in dietary fat intake. In addition, many refined foods have been largely replaced with higher quantities of manufactured and processed foods (Kim, Ahn, & Nam, 2005; Kim, Moon, & Popkin, 2001). The proportion of meals eaten outside of the home has also increased in recent years, with almost half of food expenditure among urban households devoted to meals eaten outside of the home (Lee & Sobal, 2003; Kim, 2004). These dietary changes have resulted in an increase in overnutrition within segments of the population.

Overweight and obesity. The combination of low physical activity and high caloric intake results in increase of body mass. Resulting overweight and obesity serves as a risk factor for many chronic diseases. The Korea National Health and Nutrition Examination Survey is a cross-sectional study of a representative sample of the population performed every three years. Data obtained in 1995, 1998, and 2001 included anthropometric measurements of height and weight that were used to calculate body mass index (BMI). Changes in BMI between these three collection periods are presented in Table 2. The survey results indicate that the overall rates of overweight and obesity (BMI = 25.0) are increasing at a high rate in the Republic of Korea. In 1995, 18.8% of men and 22.1% of women were overweight or obese (Kim, Moon, & Popkin, 2001). In 1998, 25.1% of men and 28.1% of women were overweight or obese, and in 2001, 32.4% of men and 29.4% of women were overweight or obese (Kim, Ahn, & Nam, 2005). Kim, Ahn, & Nam (2005) divided the 1998 and 2001 samples into 5 year age groups, and found a significant increase in BMI between the two samples in each age group. The mean BMI of the sample was 0.5 units higher for men and 0.4 units higher for women in 2001 than in 1998.

Historical perspective

Theories are practical explanations of the phenomena of behavior change. Behavioral theories should help to guide principles of practice. Principles of practice should also influence

theories as well as the design of interventions. Theories are influenced by values and in turn, they should influence everyday public health practice. The social values of a society greatly influence the context for a theory. Theory developed in the USA may be useful but the interpretation of the constructs will influence how the theories explain behavior. Similarly, practice will influence the interpretation of the words within a theory. In concert, both theories and practice should influence the interventions that are delivered and ultimately those that are deemed to improve public health practice in the area of prevention.

A historical view provides an important and interesting understanding of current behavioral theories. For the purposes of this paper, three theories will provide a historical context for the basis for our current understanding of human behaviour. The three include 1) psychodynamic theory, 2) trait theory and 3) behavioral theory.

Psychodynamic theory (Freud, 1917, 1933) attempts to explain human behavior from an unconscious level. The authors of psychodynamic theory relate to human behavior as a manifestation of a dynamic interplay of inner forces. These inner forces operate below the level of consciousness and influence our decisions, behavioral lifestyles and thoughts. Understanding the psychic determination and unconscious thought of an individual has not been demonstrated to improve our ability to help the individual change risk taking behaviors. While psychodynamic theory may be a good method for looking at behaviors retrospectively, it is not a good predictive mechanism. It is difficult to facilitate behavior change behaviors if the individual who wishes to change is dealing with unconscious thoughts. An individual's self-insight into their unconscious dynamic forces may help for many diseases that are not behavior related, yet research indicates that simply changing an individual's belief about a risk taking behavior does not result in behavior change.

The second historical theory is trait theory (Allport, 1961; Cattell, 1966), which involves the area of personality traits. Trait theory postulates that human actions are governed by traits which are regarded as a broad enduring disposition to behave in a certain way. Certain traits, such as a feeling of internal control, or an outgoing personality or extraversion, influence how individuals behave. The trait may be mediated or moderated by different social or cultural environmental situations. Again, traits may help to explain behavior, but do not explain adoption of risk taking behaviors or the alteration of these behaviors.

The third historical theory of interest is related to the work done by Skinner (1953, 1969) on radical behaviorism. Skinner believed that behavior was controlled jointly by genetic endowments and environmental contingencies. Under this theory, behavior is thought to be cued by the stimuli that precede it, and shaped and controlled by reinforcing stimuli that follow it. This one sided interaction determination, or directional influence, postulates that behavior is influenced by the environment has an influence on the person and the person then adjusts their

behavior appropriately. One sided interaction between the person their behavior and the environment is initially believed to help us explain human behavior.

In 1971, Albert Bandura published the first book on social learning theory. He proposed a triadic reciprocal causation between the person (e.g. their traits), their behavior and the environment. Bandura subsequently adapted his original social learning theory to social cognitive theory in 1986. The basic premise of the theory, that behavior is determined by multi-authored factors (both internal and external) influencing an individual, remains the same. Behavior therefore is the result of a number of choices with various options in any given situation. People are influenced or controlled by external factors; however, they are capable of influencing their own actions and going against those factors. Behavior is a continuously changing learned experience. Learning a behavior occurs both as a direct consequence of performing that behavior and, more importantly, vicariously from watching others perform that behavior. Most of the behaviors in our repertoire are initially acquired vicariously. Whether a behavior is acquired through direct participation or vicariously, it must be reinforced in some manner. Reinforcement of a behavior must be apparent to the individual.

There are basically three types of reinforcements that can be either positive or negative. Positive reinforcements generally bring pleasure where negative reinforcements either bring dissatisfaction or no positive reward. The three types described in the literature and facilitated in Bandura's worked include external reinforcements, vicarious reinforcements and self reinforcements. External reinforcements are those provided from outside the individual's control and often times those that are initially acquired. Compliments offered from family and friends when an individual stops smoking or loses weight are considered external reinforcements for the weight reduction or quitting smoking. Vicarious reinforcement occurs when the behavior performed by another does not have a direct effect on the observer, but the observer is vicariously rewarded. For instance, when an individual who loses weight is complimented for the weight loss, an observer may lose weight because they have learned that positive attention will result. Lastly, self reinforcement is the strongest, most powerful reinforcer. An example of self-reinforcement is an individual quitting smoking or losing weight to meet his or her own personal goals.

In addition to social cognitive theory, there are a number of other theories that have been developed to help explain or predict why people behave as they do in relationship to their health. A number of individual behavior change theories such as the health belief model, the health locus of control, attribution theory, theory of reasoned action, and the transtheoretical model of change (stages of change) all provide some guidance to why people behave as they do. These theories of behavior focus primarily on the individual yet address the context in a peripheral manner. Theories that primarily address the behavior as a result of the environment include self regulation, psycho-social models, theories of social support, and theories of social

networks including social capital, community empowerment, and diffusion of innovations.

As more is known about factors that influence the performance or nonperformance of any given behavior, it becomes more likely it is that public health practitioners are able to design a successful intervention to change or reinforce that behavior. Although no theory may ever be able to state all of the infinite number of variables that may or may not influence behaviors, there is a growing consensus that there are only a number of variables that need to be considered in order to predict and understand behavior. These are the person or group, the behavior itself, and the context or environment in which the behavior is performed.

In Health Promotion there are at least two approaches to changing human behavior. For one approach, practitioners change the individual's behavior within an environmental context. For the second approach, practitioners work to change an environment to support the change for the individual. In the former, the main focus is on the individual. The community or the environmental context is only taken into consideration as a background. In the latter, the primary focus is on changing the community and the environment to help reinforce individual behavior change. Groups of theories that focus on community change, rather than the individual alone, help to facilitate change through system-wide approaches. The two health promotion perspectives should not be mutually exclusive to achieve sustainable change for the betterment of the health of a population. Both must be facilitated in concert in order for true behavior change to occur and be sustained.

Tobacco as a case example

Tobacco is an excellent example of the use of the individual and community approaches in concert. The reduction in the consumption of tobacco in developed countries provides an appropriate model for the ways that lifestyle modification can occur. Strategies using the community environmental approach that have been demonstrated to be efficacious include increasing of the price of cigarettes through higher cigarette taxes, cigarette advertising and promotion bans, warning labels, and restrictions on public smoking. Each of these strategies has been demonstrated to have an impact on the consumption of tobacco. Individual level strategies that have been demonstrated to be effective include the availability of smoking cessation programs and access to nicotine replacements and other cessation therapies. Again, each of these has been demonstrated to show effectiveness in reducing consumption.

Increasing taxes is the most effective method to reduce consumption of tobacco. Evidence from countries such as the US, Australia, Western Europe indicates that a 10% price increase reduces demand by 4% in high-income countries and as much as 8% in low to middle-income countries. The increasing of the price of tobacco affects the individual through a reevaluation of priorities for their disposable income. Importantly, young people in the pool are the most price responsive and tend to be most affected by the increase in tobacco prices, as they have

generally limited income and competing demands on that income. An increase in tobacco prices is attributed for the downward blimp in the prevalence of youth smoking in the United States since 1998. Youth smoking has also been especially responsive to price because youth lifestyle does not completely evolve around the addiction.

Increasing consumer information, and especially increasing the size of warning labels, provides a constant awareness to smokers of the health hazards of consumption of tobacco. The restriction of public smoking helps smokers quit by reducing opportunities to smoke and creating a social mores that smoking is not supported in that society.

Individually, providing cessation services for the smoker through their medical practitioner or through non-government organizations is necessary to reduce consumption. The use of nicotine replacement therapies (NRT) in conjunction with behavior strategies has been demonstrated to produce substantial and significant cessation rates compared to behavioral programs alone. NRT doubles the effectiveness of cessation efforts. It is important for societies and governments within those societies to provide access to nicotine replacement and other therapies by reducing regulations and considering subsidies for poorer smokers.

A comprehensive approach to smoking addresses the person, the social and physical aspects of the environment, and the behavior of smoking itself. Only in concert can sustained reduction of the consumption of tobacco occur within a society. No single approach has ever been demonstrated as effective as addressing efforts in all three areas.

Nutrition and Physical Activity

The problem of obesity provides another example of the application of the social cognitive theory. The health behaviors that relate obesity are eating and physical activity. To reduce the prevalence of obesity in a society, these behaviors can be addressed similarly to the model provided by tobacco, addressing the person, the behavior itself and the environment provides us a framework on how we may be able to begin to change society to consume fewer calories and become more physically active.

The behavior of eating itself can be viewed as an individual behavior, but it can be addressed on the levels of the individual, environment, and the behavior itself. Reduction of caloric intake can be addressed with an individual behavioral approach. A physician can work with the patient to alter the type and amount of foods eaten, which will assist the individual in reducing caloric intake.

Environment appears to play a significant role in dietary habits of individuals. The physical, social, and cultural environments all serve as important influencing factors. The environment consists of variables such as where someone eats, with whom food is consumed, how food is viewed culturally, and the socialization, availability, and access to food. All of these factors influence the ability of an individual to alter their dietary intake.

When approaching changing dietary behavior, it is important to consider all aspects within an individual's life that may influence caloric intake. Educating individuals about their need to lose weight and the importance of weight loss on health status is an important aspect of helping patients change their lifestyle. However, education alone does not result in behavior change. In fact, most individual interventions with patients have limited success when implemented alone. As with the tobacco example, education and individual approaches to dietary change should be used in concert with environmental changes that will assist people to practice healthier behaviors. These environmental changes can be accomplished through creation of community-level programs and the implementation of policies. Programs and policies aimed at changing the environment of communities and nations may combine synergistically with individual approaches to impact dietary patterns and improve health. For instance, policies that increase the availability of healthy foods such as fruits and vegetables, while increasing costs associated with unhealthy foods, change the environment and have the potential to make an impact at the population level.

What can physicians do to help their patients change their lifestyles? This is a question that is often asked. The following are a few suggestions to promote behavior change.

- Assess whether a person smokes cigarettes or measure the BMI of the individual
- Advise that change is needed
- Assist the person with the changes being made or refer them to someone that can help.
- Follow-up with patients in chart notes
- Work with policy-makers to increase availability of health foods
- Collaborate with community leaders to promote physical activity
- Consider implementation of policy to reduce consumption of tobacco

Table 1. Top 10 causes of death in 2002 for all ages in the Republic of Korea. Rates per 100,000 deaths. (Excludes senility). Source: World Health Organization.

Males		Females	
Cause	Rate	Cause	Rate
Cerebrovascular disease	72.7	Cerebrovascular disease	81.7
Lung cancer	38.3	Diabetes mellitus	26.0
Liver cancer	34.8	Ischemic heart disease	23.1
Chronic liver disease, cirrhosis	34.1	COPD	19.6
Stomach cancer	31.7	Stomach cancer	17.2
Ischemic heart disease	27.2	Hypertensive disease	14.3
COPD	25.0	Lung cancer	13.9
Suicide/self-injury	24.7	Mental disorders	13.7
Motor Vehicle Accidents	24.7	Liver cancer	11.3
Diabetes mellitus	24.3	Suicide/self-injury	11.2

Table 2. Percentage of adults that were overweight or obese (BMI = 25.0) between 1995 and 2001 in the Republic of Korea. (Korea National Health and Nutrition Survey).

Year	Men	Women
1995	18.8%	22.1%
1998	25.1%	28.1%
2001	32.4%	29.4%

1Kim, Moon, & Popkin, 2001.

2Kim, Suh, & Choi, 2004.

3Kim, Ahn, & Nam, 2005.

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