

Examining the Trajectory of Health Behavior in Smokers as a Pre-Awareness Determinant in the Field of Personalized Medicine

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Abstract

Smoking is widely recognized as a significant factor in the global disease burden, leading to 4 million deaths annually throughout the globe. Various research has shown that the prevalence of smoking worldwide is on the rise among both males and females, particularly among the younger demographic. Behavior modification is a primary objective in public health initiatives that prioritizes preventive measures before the occurrence of illness. Utilizing innovative personalized medicine programs may serve as a significant prognostic determinant in modifying the behavior of smokers and enhancing societal health. Thus, this review research presents an appropriate framework for personal medical applications that may effectively alter smokers' health and health behavior.

Keywords: Personalized medicine, Smoking, Health behavior.

Introduction

Smoking is recognized as a contributing contributor to the global illness burden, resulting in the annual deaths of 4 million individuals worldwide (1). Various research has shown that the global incidence of smoking is increasing in both genders, particularly among the younger population. According to the World Health Organization, it is projected that by 2030, the global death toll from smoking will exceed 10 million individuals (2). This significant loss of life will primarily impact individuals in their middle-aged and productive years, reducing their life expectancy by 20 to 25 years. The age range of individuals between 35 and 61 years old constitutes the demographic makeup of

society (3). Suppose the current pattern of tobacco use continues. In that case, it is projected that out of the 1.3 billion smokers worldwide, there will be around 450 million fatalities caused by smoking during the next fifty years (4).

Modification of conduct

Behavior modification is a primary objective in public health strategies that prioritizes prevention before illness (5). This is particularly crucial in nations with low and moderate incomes. Due to meticulous evaluation in recent decades, the cost-effectiveness of healthcare expenses and the advantages of healthcare treatments have been thoroughly examined. The user's text is enclosed



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in tags. Behavior change in public health is synonymous with communicating Behavior change and its impact on society (4, 5).

Context

A multitude of health disorders and circumstances may be attributed to hazardous Behaviors, such as alcohol use, substance abuse, tobacco use, dangerous driving, excessive eating, or engaging in unsafe sexual activity (6). An essential inquiry into health Behaviors pertains to the methods of accurately forecasting and altering, or embracing and maintaining, health Behaviors. Thankfully, people have a fundamental ability to govern their actions (6, 7). Self-regulation may abolish unhealthy Behaviors and can be replaced with health-promoting Behaviors such as physical exercise, weight management, proper diet, oral and dental cleanliness, condom usage, and accident avoidance. Changing health Behavior encompasses the intentional and self-driven processes that lead to the cessation of health-endangering Behaviors and the adoption and maintenance of health-promoting Behaviors (8).

Evolved Behavior change programs include diverse activities and strategies that target individual, community, and environmental factors influencing human Behavior. Behavior modification is a recently coined phrase in the field of health promotion that should be distinct from the notion of Behavior modification, which has a distinct definition in clinical psychiatry (9).

A novel idea gaining traction in the US healthcare system is that implementing little modifications is more feasible and easier to handle (10). It is unnecessary to implement radical and significant modifications to one's lifestyle to see its advantages; even a tiny amount is preferable to none. The subject of nutrition and exercise demonstrates the advantages of making tiny and moderate adjustments (11). For instance, the many phases of Behavior modification, including physical activities, have the potential to enhance life span, manage body weight, and bolster mental well-being (11, 12). In addition, they mitigate the likelihood of specific ailments such as type 2 diabetes, cardiovascular illnesses, and some forms of cancer (7, 12).

Hypotheses

Behavior modification programs often priorities the use of several behavior changes theories that were developed throughout the 1980s (13). These ideas are significantly similar in their definition of individual activities as a catalysts for change. Behavior modification programs, or interventions, often concentrate on implementing activities that assist people or groups in diminishing risk

Behaviors and vulnerability (14). Some examples of theories in this context include metatheoretical theory (stages of change), Behavior change model, theory of rational Behavior, health belief model, theory of planned Behavior, diffusion of innovation, and health action process approach. Since the late 1990s, a concentrated effort has been made to integrate many health Behaviors change theories into a cohesive, comprehensive, unified theory (15).

Equipment

Care groups consist of 10 to 15 volunteer health educators who meet regularly in the community. *Barrier assessment* is a rapid evaluation method used in Behavior change initiatives to identify the factors influencing Behavior (16). Community-based disinfection is a Behavior modification technique used in the disinfection industry to address open defecation in rural parts of developing nations. Using shame, disgust, and peer pressure after an initial stimulation phase results in the prompt establishment and sustained utilization of the toilet (17).

Behavior change communication

Behavior change communication refers to using strategic communication techniques to promote and encourage individuals to adopt or modify new behaviors (18). *Behavior change communication*, a targeted method that emphasizes communication, is a powerful tool for promoting safety and well-being (19). It is assumed that certain forms of communication can guide people and communities to choose Behaviors that enhance their safety and well-being. Initially implemented in initiatives aimed at preventing HIV and TB, the scope of behavior change communication has now expanded to include any kind of communication that seeks to assist people and groups in modifying their behavior. They choose options that have a beneficial impact on their well-being, such as immunization, screening for cervical cancer, and the use of disposable needles (20).

The Johns Hopkins Centre for Communication Programs is a global leader in health-related communication Behavior modification programs, making a significant impact in poor nations. Their initiatives span a wide range of health issues, from reproductive health and family planning to malaria, HIV, and AIDS (21). The dissemination of global media via mass communication channels has been a game-changer, facilitating the adoption of beneficial Behaviors in Burkina Faso, the Democratic Republic of Congo, and Mozambique (22). The center's work also inspires curious adolescents to seek information, supporting initiatives aimed at decreasing the incidence of HIV/AIDS among

young people in Botswana (23). The reasons for the failure of health education activities are listed in Table 1, providing valuable insights for future initiatives.

Five factors affecting health-related behavior and conditions

Five elements influence health-related Behavior and conditions. Health behaviors are integral components of a broader social framework. Supportive reforms in the whole system are necessary for sustainable improvements in health behaviors. Table 2 shows five factors affecting health-related behavior and conditions (24). Theories may be classified into two distinct categories:

- 1) Explanatory theories elucidate the underlying causes of an issue and facilitate the identification of modifiable components that contribute to the problem.
- 2) Theories of transformation facilitate the development of health treatments.

Factors influencing smoking cessation

Smoking cessation Behavior is a complex issue that involves several dimensions (25). Factors associated with smoking cessation may be categorized into personal, societal, and environmental aspects. Research has shown that individual characteristics

are associated with the act of quitting smoking (25). Multiple studies have shown that the longevity of smoking cessation varies across individuals. When designing smoking cessation programs, it is advisable to include treatments that involve the concurrent use of individual counselling, nicotine replacement medication, active monitoring, and follow-up for those who are prepared to stop smoking (26). Smoking is the primary avoidable factor leading to cardio-pulmonary disorders and is responsible for one-third of all fatalities in North America. This habit significantly harms society and individuals, resulting in millions of dollars in healthcare costs (27).

Approximately 45 million Americans in the United States persist in smoking, and smoking is responsible for 500,000 avoidable deaths in this nation. Out of the whole global population, a staggering 744 million individuals are now awaiting their demise as a result of their smoking habits (28). This Behavior leads to the unfortunate loss of about 7 million years of life. Of the people who smoke every day, 81% started smoking their first pack before the age of 38 (29). Additionally, it is projected that almost half of the teenagers who presently smoke will continue to do so until they pass away from lung disease. They will persist in

Table 1. The reasons for the failure of health education activities.

Row	Failure reasons
1	Societal customs and expectations
2	Disseminating material that contradicts the objectives of education
3	The intended modifications in Behavior are not attainable
4	Inadequate selection of the target population
5	Insufficiency of the instructional approach used with the specific Behavior and target demographic

Table 2. Factors affecting health-related behavior and conditions

Row	Factors
1	Intrapersonal variables refer to individual characteristics and traits.
2	Interpersonal elements include interactions and relationships between individuals.
3	Organizational factors pertain to the structure and functioning of institutions.
4	Society factors encompass the broader cultural and societal influences.
5	Public policy aspects relate to government regulations and actions.

experiencing mortality due to smoking (27-29).

Smokers' Behavioral shift trend

When providing individual counselling in smoking cessation programs, it is essential to consider each individual's unique traits and characteristics (30). This includes individuals who are in the stage of preparing to quit smoking and have sufficient motivation to do so (30). Smokers benefit from being given priority in smoking cessation intervention programs. It is essential to take into account nicotine addiction and the symptoms of withdrawal in any smoking cessation program (31). Engaging in telephone follow-up and offering help to navigate challenging circumstances related to smoking, particularly during the first days of stopping, via the provision of social support decreases the likelihood of unsuccessful smoking cessation. The inter-theoretical model, also known as TTM, has proven to be a highly effective tool in health education for smoking cessation (32). The Prochaska approach, developed by Prochaska et al. in the early 1980s, has been widely adopted globally for over 17 years. It has been particularly successful in addressing a variety of health-related behaviors, with a strong focus on smoking cessation (33).

This model offers a framework for understanding Behavior modification and serves as a foundation for assessing individuals' preparedness for change and interventions for actual Behavior modification. This significant psychotherapy model operates on the idea that individuals do not make abrupt decisions to alter their Behavior. Instead, Behavior change is seen as a progressive process that can be split into several parts and phases. People undergo these steps in order to transform (30-33).

The inter-theoretical model (TTM) is composed of four key structures: stages of change, processes of change, self-efficacy, and decision-making balance. In the pre-contemplation stage, individuals are not yet considering a behavior change within the next month. This could be due to a lack of knowledge or information about the desired behavior, past negative experiences, or a lack of motivation. Understanding these stages is crucial for effective behavior change interventions (30-33).

During the contemplation stage, individuals intend to adopt a specific Behavior within the following month and carefully consider the pros and cons of that behavior. Individuals intend to adopt a specific behavior during the preparation stage within the next month (34). They actively seek to plan, acquire the required equipment, and make preparations to change their behavior successfully. During the action stage, individuals successfully adopt the intended behavior, lasting less than one month after the Behavior change. During the maintenance stage, the last step, individuals successfully adopt the desired behavior

for a period beyond one month and develop a sufficient level of self-efficacy when confronted with enticing circumstances. One fundamental premise of this model is that at each of the aforementioned steps, there is a potential for deviation, mistake, and regression, leading to a return to the former behavior (35). The following are the seven phases related to smoking Behavior: During the pre-contemplation stage, individuals persist in smoking and have no intention of quitting within the following month. During the contemplation stage, individuals engage in smoking Behavior while also contemplating the possibility of quitting smoking during the next month. During the preparation phase, both persons persist in smoking but have intentions to quit smoking within the next month. The action phase refers to the period when individuals have just stopped smoking, having done so for less than one month. The maintenance phase, on the other hand, pertains to those who have successfully abstained from smoking for more than one month (36). Figure 1 displays the cancer risk variables linked to smoking, as well as personalized medical support.

Behavioral patterns Change processes refer to overt and covert actions individuals employ to modify their desired behavior (37). These processes encompass 34 activities, which can be categorized into two groups: cognitive processes (such as increasing knowledge, experiencing dramatic relief, re-evaluating the environment, and engaging in self-liberation) and Behavioral processes (including social liberation, reverse conditioning, stimulus control, reinforcement, and establishing auxiliary relationships). Cognitively, an individual autonomously gets information, but in Behavioral processes, information is obtained from the surrounding environment (36, 37).

The conducted investigations revealed that pre-action phases (pre-contemplation, meditation, and preparation) are emphasized in using processes, whereas maintenance and action stages rely more on Behavioral processes. Individuals' movements are determined by their actions (36, 37). Properly executing these actions in the correct sequence enables progression to the next phase. Conversely, incorrect or insufficient execution of these actions will disrupt the progression to the next phase. Self-efficacy, a key component of the phases of the change model, plays a significant role in individuals' ability to successfully modify and sustain desired behaviors (38). It is the individual's confidence in their capacity to carry out a certain behavior. In the context of sustaining behavioral changes, particularly when confronted with circumstances that may lead to a relapse in behavior, a strong sense of self-efficacy is essential. For instance, an individual who is attempting to stop smoking needs a strong sense of self-efficacy to resist the temptation to smoke in

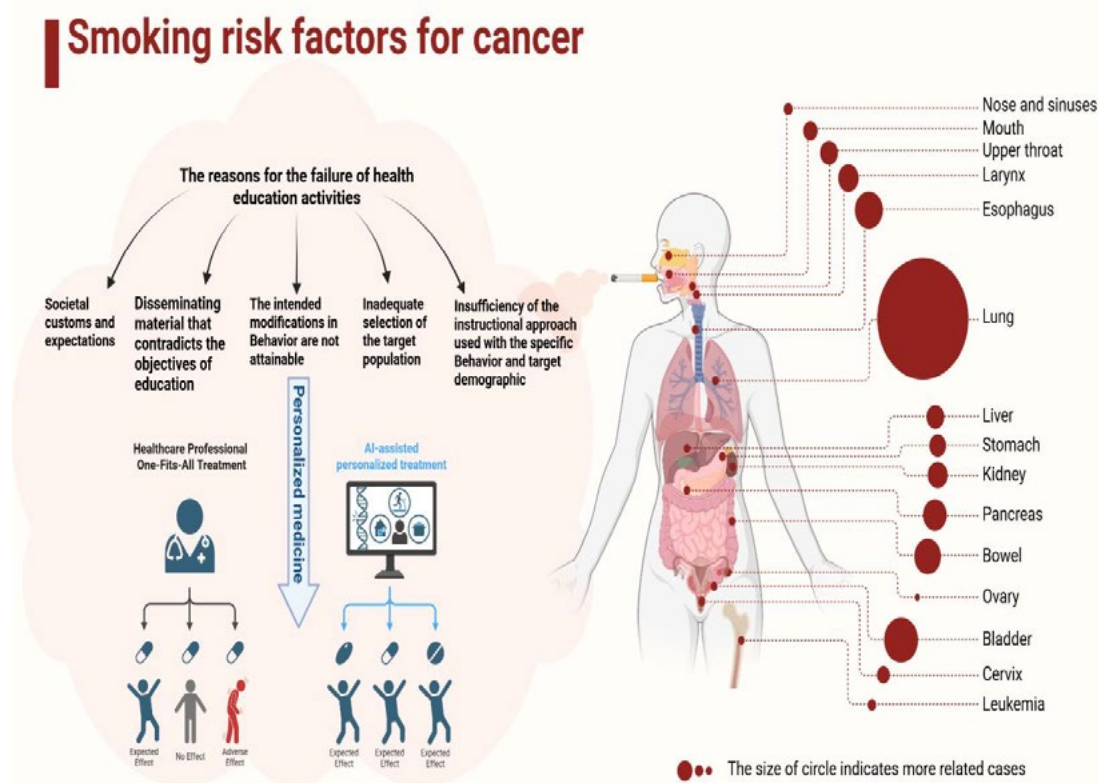


Fig1. The cancer risk factors associated with smoking along with personalized medical assistance.

circumstances that may trigger a relapse, such as social gatherings and financial difficulties (38, 39).

Decisional balancing, a crucial component of the metatheoretical model, is a significant framework for understanding the deliberate process of Change. It involves individuals evaluating the advantages and disadvantages of the intended course of action. In the context of behavior change, this scenario is seen as a decision-making equilibrium, when individuals cognitively assess the positive features or advantages and the negative aspects or barriers of specific behavior. They then carefully study and evaluate the rationale for either adopting or not adopting the behavior change. This concept is highly relevant in our research and practice, as it helps us understand the thought process behind behavior change decisions.

Conclusion

The fundamental objective of public health efforts is to implement preventative interventions to modify the behavior of smokers before the onset of illness. Implementing cutting-edge personalized medicine programs may be crucial in altering smokers' behavior and enhancing societal well-being.

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