Health Communication in Nutrition for Cancer Prevention in Thailand

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ABSTRACT

Cancer has been ranked first of the Thai mortality causes. As dietary factors affect the risk of cancer, communication is crucial for providing beneficial nutritional knowledge for patients to change their daily diets accurately. The

communication could be through the use of the internet, as there is currently media that could be easily accessed at a large scale. As a result, modern technology could facilitate the interaction between citizens and nutritional professionals, leading to healthy lifestyles. For example, the nutritional labels of products could be read by using IoT, which is a mobile application. It is also believed that devices will be developed to help prevent cancer in the future.

Keywords: health communication, nutrition for cancer prevention, IoT, social media nutrition, nutrition labeling

INTRODUCTION

One of the most essential processes for a human's daily life is communication. As a result, there are lots of developments to improve and adapt for many applications. The main example here would be medicines, with the process called "health communication," that is necessary for health professionals to transfer useful medical messages to their patients to gain a better understanding and alter their healthy lifestyles [1].

Nowadays, the prevention of cancer is focused on by people across the world, as it is a common cause of mortality and has an expensive cost of treatment [2]. It is believed that there are various factors of the disease including diets, chemicals, viruses, and genetics [3]. As some types of cancer are related to food, such as gastrointestinal cancer, eating unhealthy food could increase the possibility of getting cancer. Consequently, one of the easiest prevention methods is to manage nutritional habits.

To prevent cancer, the American Cancer Society published a guideline called Diet and Physical Activity for Cancer Prevention in 2020. The guideline suggests controlling one's weight and getting all necessary nutrients by eating healthy food, including multiple-colored vegetables and fruits. Moreover, people should avoid drinking fruit squash because it contains too much sugar. It is also essential to avoid refined grains, red meats, and processed food. Furthermore, alcohol consumption should be avoided [4]. This guideline is different from the old one, which stated that 1 drink a day is acceptable. However, it is now believed that the best thing to do is to refuse to drink it. The Expected Cancer Incidence attributable to alcohol consumption in Thailand in 2021 found out that although alcohol campaigns could not trigger heavy drinkers to stop, it could reduce the number of new drinkers [5].

Thailand is inclined to increase the cancer mortality rate continuously. According to the Strategy and Planning Division, Ministry of Public Health, there were approximately 112.8 cancer deaths per thousand of the population in 2015, and 125 cases per thousand in 2019 [6]. Thai citizens tend to drink a huge amount of alcohol and consume an insufficient amount of vegetables relative to the suggested amount from National Cancer Institute guideline composed by Economic Intelligence Center (EIC) of Siam Commercial Bank. Although the survey found that 98.8% of the Thai population eats fruits and vegetables at least once a week, the amount of consumption of fruits and vegetables is lower than the percentage in 2013 by 13.4% [7]. The reason is that Thai people have freedom of eating choices, and they usually choose to eat their favorite things, most of which are unhealthy. Furthermore, social media is a tool for food influencers to affect people's choices. Nowadays, spicy and sweet food from the convenience store is widespread by the influence of the Internet [7]. It is a factor that provokes people to eat insufficient amounts of fruits and vegetables and get excess energy from less nutritious, convenient foods, leading to a higher risk of cancer.

Nutrition and health communication: Communication is a vital process of message transmission which includes sender, message, channel, and receiver. The sent messages sometimes need to be encoded or translated. For example, medical translations are essential for patients to understand medical messages. As a result, it could be concluded that health communication is a fusion of communication and medicines used to enhance health. Communication in cancer is often through the use of mass media such as brochures, health magazines, and manuals. However, people access

various modern media, so most of the health information can be received on the Internet on platforms such as Facebook, Line, Twitter, or YouTube [8].

Thai nutritional labels only indicate the nutritive value of the products. Moreover, Guideline Daily Amounts (GDA) improved by THAI FDA (Electronic Transactions Development Agency. Ministry of Digital Economy and Society, 2019) have allowed consumers to check for the presence of specific nutrients in a product and to make an informed food choice. Afterward, entrepreneurs use nutritional logos for their products in order to represent healthy products, which also helps consumers make decisions. For instance, ready-to-eat meals could be approved by considering eight nutrients including: 1. Fats 2. Saturated fats 3. Protein 4. Fiber 5. Sugars 6. Sodium 7. Calcium 8. Iron. The products should not contain too many nutrients that can provoke the risk of non-communicable diseases (NCDs). When it comes to drinks, the amount of sugar and fats should be considered to display the Healthier choice logo in Figure 1. However, there are not any Thai labels or logos that represent functional food for cancer prevention or phytochemical ingredients for cancer prevention.

According to the nutritional label knowledge survey by students from public health programs, people are interested in the expiration date of the products, while the harmful ingredients (Monosodium glutamate, sugar amount, etc.) are details that few people pay attention to. Few of them are informed about nutrition labeling, serving size, and recommended dietary allowance [9].

The Communication on social media: Nowadays, everyone is allowed to communicate with one another by the means of smartphones and the Internet, which also affects health information in social media [10]. Based on Thai Internet behavior in 2019, Thai users spent 10 hours and 5 minutes a day on average on the Internet, which increased every year. It also reports that YouTube, Line, and Facebook are the top three media platforms used by Thai. This provokes citizens to learn health information from media instead of books. Somporn, Meekruea, and Sam-Ang Seubsman reported that health magazines could not trigger people to realize the advantages of fruits and vegetables [11]. Therefore, people's increasing access to social media platforms has caused the Internet to become a vital part to altering eating behavior.

Figure 1. Healthier choice logo from Thai FDA. This logo will display on label of product which pass the Thai FDA criteria low sugar, low sodium, or low fat.

Social media is the new media communication, as it currently allows a sender to create and send a message and receive feedback from the receiver immediately and conveniently through the use of online devices. It is also beneficial for sharing and exchanging ideas with one another, leading to a network connection [12]. This could be used for encouraging people to change their attitudes and behaviors. Social media can be used as a tool for a health promotion campaign. For example, the initiative to encourage intake of 400 grams per day of fruits and vegetables was created by the means of the Internet to make people realize and abide by the recommendations of the Minister of Public Health of Thailand. Innovation diffusion theory can be used for news and innovation communication to the target groups, taking into account their readiness to receive and apply the information. The recipients can be categorized by their ability to perceive messages into 5 groups including Innovator, Early adopter, Early majority, Late majority, and Laggard. Furthermore, it is necessary to design the message to be suitable for each group of recipients [13].

Nutritional advice for cancer prevention is to eat more than 400 grams or more than 5 servings per day of fruit [14]. It is useful to avoid alcohol, grilled food, and red meat. Although senders make an effort to send the messages to the receivers, the recipients have difficulty in knowledge translation. For instance, 400 grams of vegetables is difficult for receivers to estimate. Based on the 63 office workers survey in Bangkok, they have little knowledge about cancer prevention. Although they know basic cooking, they misunderstand that fiber powder and antioxidant supplement could prevent cancer. As a result, they could not apply the knowledge in their daily lives.

Numerous online social medias mainly contain information about food for cancer patients, while the details about cancer prevention commonly located in NCDs don't get much attention. Furthermore, the Ministry of Digital Economy and Society of Thailand created an anti-fake news center in Thailand to reduce the fake news about food and cancer, and to cooperate with the ministry of public health to provide accurate health news on social media. Although there is not any specific information about food for cancer prevention, citizens could be given details about healthy food and follow the details. Thai citizens mostly get information via the Internet, especially Facebook. Consequently, designing the information to be viral, interesting, and applicable, is going to be useful for preventing cancer by food in the future.

Adaptive technology applications in nutritional communication: Nowadays, technology facilitates healthcare communication in many ways. For example, Big Data analyze systematically and deal with data sets. Furthermore, lots of technologies improve health services, such as Telemedicine for giving advice and the Internet of things (IoT) [15]. As a result, technology is also applied to give nutritional advice through devices such as Fitbit and some applications (apps) which can scan barcodes and inform users about the nutritional facts of products [16]. The main example here would be the Ministry of Public Health's Food Choice application, which could be installed on both Android and iOS, and can scan QR codes of food products and provide their nutrients, calories, and sugar to control weight. Although there are not many apps that could determine food for cancer prevention, developers have tried to create new applications such as MyFitnessPal, but they come with some limitations [17].

As a result, IoT is developed in the form of taking pictures and image processing with a database called

Smart Nutrition Monitoring System, which would provide information of photographed food including the type and amount of each ingredient [19]. The processing of IoT in nutrition calculation is displayed in Figure 2. In 2010, Tambe, Nerkar, Chorage, Dokhe, and Shinde explained that this system not only helps people control their weight through the means of Big Data to give advice, but it also records the consumption of users, which is going to be developed to become capable of sending it to health professionals in the future [17]. In 2015, medical oncologists were more interested in precision medicine, while Intel, The Oregon Health, and Science University launched a joint project called the Collaborative Cancer Cloud. This is a platform that can be used to help decide what medicine could be an effective treatment without a bad response from patients' genes.
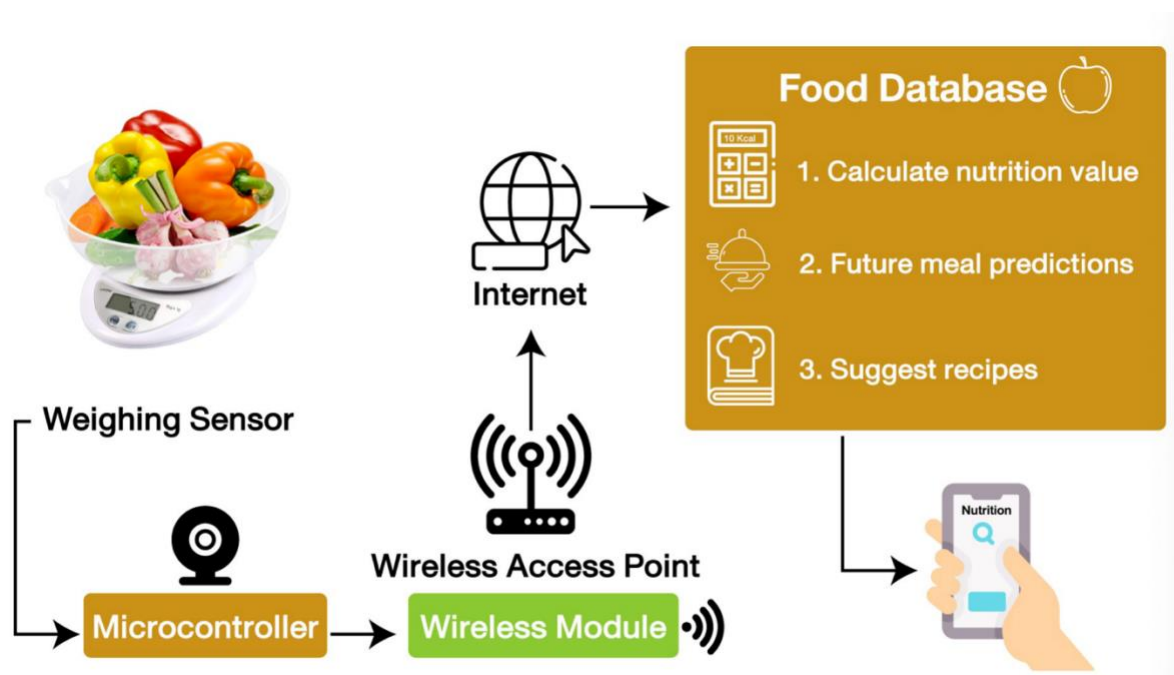

Figure 2. The process of IoT process for analyzing nutrition value from cloud database. This picture is adopted from Sundaravadivel, P., Kavya Kesavan, L. Kesavan, Saraju P. Mohanty and E. Kougianos. "Smart-Log: A Deep-Learning Based Automated Nutrition Monitoring System in the IoT." *IEEE Transactions on Consumer Electronics* 2018, 390-398.[18]

In the future, there might be some developments for genetic collection of a population, which is going to be helpful in making suggestions about food for cancer prevention. In Thailand, it might be necessary to use citizens' genetic databases for advising on genetic profiles that are quite different in different parts of the country [20].

IoT is going to help analyze nutrients of functional foods that can prevent cancer, and it will inform users. Moreover, it will help physicians to notify the number of nutrients that exceed the limitations and increase the risk of cancer.

CONCLUSION

Health communication is an essential process used as a means of health promotion as well as the modification of health behavior to achieve the desired health prevention result. In Thailand, cancer is the number one leading cause of death, however, many types of cancers are preventable through the consumption of certain types of foods. Behavior modification for cancer prevention requires knowledge and communication technologies to help change behaviors. Especially when people's lifestyles have changed where more social media information

has been used and consumed. Therefore, the design of nutrition knowledge diffusion for cancer prevention must be adjusted according to the media consumption behavior of the people and the technologies that play important roles in their ways of life, such as the use of smartphones with various applications to support the needs of users. As a result, there is an integration of nutritional knowledge, communication, and technologies which leads to the development of an IoT to read the nutritional information from food images and provide recommendations for consumption. Thus, the adoption of nutritional and cancer prevention knowledge, together with IoT, to develop an application for communicating food recommendations will be one of the tools to help in preventing cancer caused by unhealthy consumption.

List of abbreviation: FDA: Food and drug administration, NCDs: Noncommunicable diseases, IoT: Internet of things

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