

The Roles of Nutrition Information on Healthier Food Choices

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Abstract

Nutrition information on food labels is designed to facilitate healthy diet programs. Nowadays, consumers prefer to choose healthier foods based on various considerations which include nutrition information. This review highlighted interesting discoveries regarding consumer use of nutrition information as a parameter in healthy food choice. Visualization and colored designs for nutrition information were more attractive and invited consumers to select these products. Nutrition knowledge, gender, age, physical activities, economic status, and ethnicity also contributed to consumer decisions regarding food selection. The findings indicated a correlation between these factors and the role of nutrition information in healthier food selection.

Keywords: nutrition information, consumer choice, healthy foods

Introduction

The World Health Organization (WHO) produced fact sheets in 2015 showing that non-communicable diseases (NCDs) are killing 38 million people every year [1]. Four major groups of NCDs are cardiovascular (17.5 million deaths annually), cancers (8.2 million), respiratory diseases (4 million), and diabetes (1.5 million) [1]. Unhealthy diet is one factor driving these diseases. Increased blood pressure, high blood glucose levels, blood lipids, and obesity are related to unhealthy diets and disease [1].

Balancing energy intake and limiting sugar and salt consumption are beneficial for a healthy diet [2]. Nutrition information on food labels or menu information is designed to facilitate information transfer. Displaying nutrition information assists consumers to estimate the energy content of their food more accurately [3]. It also helps and encourages consumers to select nutritious foods to maintain their health [4-11]. This paper reviewed the roles of nutrition information as a benefit for healthier food choices. How nutrition information affects consumer choice was discussed and recommendations were presented.

Nutrition Information Format and Design

In this modern age, formats of nutrition information are presented on food labels and packaging as nutrition tables, guidelines of daily amounts (GDAs), and traffic light formats. A study on eye-tracking to compare these three formats showed that consumers required more time to assimilate information from the GDA format, while the traffic light format was more efficient for data transfer than nutrition tables [12]. Traffic light labels also enhanced healthy product choice [13] and consumption [14], even when the consumers were put under time pressure [13].

Nutrition labels or fact panels were early information designs in the form of tables. Nutrition table formats which lack reference point information proved less effective for consumers to differentiate healthier food between categories (especially between comparison products), and induced a potential misinterpretation of the health value [15]. The front-of-pack (FOP) label format was developed to simplify table formats [16]. FOP was reported as a trusted format and easy to interpret by consumers [17]. Thus, FOP attracted attention and was perceived as more

helpful in selecting healthier foods [16-20]. FOP nutrition labeling systems have both direct and moderating effects on attitude toward the retailer, who was perceived as having concern for consumer's health [21]. Figure 1 depicts some examples of FOP labels.

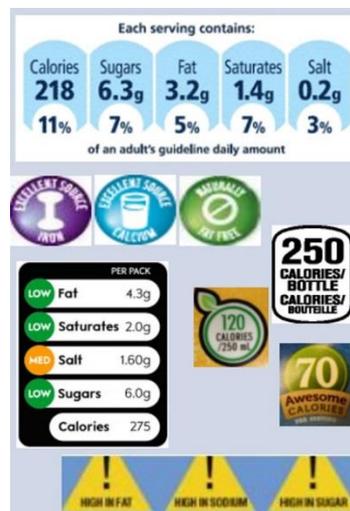


Figure 1. Some examples of front-of-pack (FOP) labels

Source:

http://www.who.int/nutrition/events/2013_FAO_WHO_workshop_frontofpack_nutritionlabeling_presentation_L'Abbe.pdf

Three kinds of FOP designs have recently been recognized, i.e. Daily Intake Guide (DIG), Multiple Traffic Lights (MTL), and Health Star Rating (HSR). In corresponding to achieve the guideline daily amount target, DIG performed better than MTL [22]. However, MTL best differentiated product healthiness comparing to DIG and HSR [23]. Most consumers used MTL labels to decide their selections [6]. Moreover, MTL menus increased the purchase of healthy food and reduced unhealthy food sales in a publicly funded recreation and sport facility, with no loss of revenue [24]. HSR, a new evaluation of FOP, was recently introduced into Australia and New Zealand [20]. Five-color nutrition labels in FOP format resulted in lower lipids, saturated fatty acids, and sodium in the shopping cart [25].

These phenomena showed that offering reference points of nutrient levels as nutritional information helped consumers to recognize healthier foods among products categories, even for options within products of the same category [15]. MTL and HSR are good examples of this reference point. However, increasing the number of additional design elements and information density slowed performance on visual information searching [26].

Label viewing was also affected by the position of nutrition information on the product package, and single-serving and dual-column formats performed better and scored higher [27]. Label components at the top and center of the label were viewed more than those at the bottom or on the sides [28]. This fact is recognized by manufacturers who usually place their brand name either on the top or center of the packaging. On the contrary, nutrition labels are usually at the bottom or back of the packaging label, which reduces viewing frequency by consumers. This might be the reason why FOP was designed to place the information more visibly on the top or front of the label and gain more attention from consumers.

Nutrition label awareness and utilization are not affected by label placement [29]. However, some formats of nutritional labeling have different effects on consumer attention. A recent study showed that variations in format did not affect consumer preference [15] or influence consumer motivation to choose healthier foods [30]. Thus, consumers are more interested in something different (i.e. a colored label, reference point, etc.) that may get more attention, than just placement or formats.

Nutrition Information used in Selecting Healthy Foods

Nutrition label utilization was significantly associated with sex, age, marital status, household size, educational level, and socio-economic status [31, 32], while label preference depended on the ability and motivation to process information, and socio-demographics [33]. Most consumers read the nutritional labeling and selected healthier products based on fats and additives information [34]. A recent study showed that students who read nutrition labels frequently were more likely to have healthier dietary intakes (e.g. less fast food and added sugar; more fiber, fruits, and vegetables) [7]. Nutritional information utilization was mainly associated with an interest in healthy eating, whereas understanding the information on food labels was mainly related to nutrition knowledge [35].

Some consumers perceived the important roles of nutritional value in selecting foods [36] and read nutritional labeling before they purchased the product [34]. Providing nutrition information through food labels helped consumers to select healthier foods [36]. As an example, showing calories and sodium content information on children's fast food meal menus will assist parents to make healthier food choices for their children [37]. Disclosing energy

content on menus reduced the prevalence of fast food consumption [6] and reduced sales and demand for fast foods [37]. Recently, it was shown that the effectiveness of evaluation and choice of healthier foods depended on consumers' health motivation, the health perception of the products [38], the health goals of the consumers [13], availability of nutrition labels, and consumers' belief that they could eat healthily [39].

Users of food labels consumed lower energy from fat, and were more likely to follow a special diet and take multivitamins or protein supplements than non food labels users [40]. Non-use of food labels, especially for trans fat information was associated with higher consumption of fried food [41]. Cioffi et al. found that the introduction of food labels reduced the total fat purchased by 7% per week, and increased the sales of 'low-calorie' and 'low-fat' foods while sales of 'high-calorie' and 'high-fat' foods decreased [42]. Another study gave a similar result whereby low fat/energy information positively influenced food and energy intake [9]. In terms of market share, nutritional label information reduced the attraction of unhealthy products, but it did not affect product choice behavior [43]. Price and habit were the main factors that affected purchase behavior and product choice more than nutrition labels [43].

Frequent use of nutrition information was associated with reducing the probability of obesity [44], hypertension [11], decreasing total cholesterol and low-density lipoprotein (LDL), and decreasing total cholesterol / high-density lipoprotein (HDL) cholesterol ratio [45]. A study on Korean adults showed that prevalence of metabolic syndrome (MetS) in the reading nutrition label group was lower (16.8%) than the non-reading group (27.2%) and not-knowing nutrition label group (47.3%) [46]. People with excess weight were reported as more likely to display a high level of interest in nutrition claims [47]. Consumers with less attention toward health status were more likely to be interested in health claims [48] than the nutrition information. This result indicated that people with health problems, who had no concern about their health status, were more likely to be interested in nutrition claims instead of nutrition information when choosing healthier foods. In addition, most consumers were motivated to make choices on regular daily meals, but ignored this for discretionary snacks or desserts [17].

Although nutrition information utilization was associated with some health conditions, it did not impact on consumer intake. Nutrition information utilization was related to the risk of hypertension, and sodium intake was not influenced by the use of nutrition information among

respondents with hypertension risk [11]. Moreover, nutrition labeling decreased energy intake in lean females, but had no effect on obese females [14]. However, answers from the questionnaire suggested a reduction in selecting high calorie meals with available calorie information, but there was no significant impact on purchasing behavior [49].

Some people did not use nutritional label information as a consideration in choosing healthier foods. Their reasons for this behavior included not caring, already having a good idea about nutrition information, not having time [29], and reading difficulties [34]. Lack of understanding nutritional labels may result from failure to understand the terms, symbols, and values because of poor presentation of the information and concerns about the accuracy of the data [32].

Some attempts have been made to attract consumer attention to utilize the available nutrition label information. Color coding is well known to increase consumer attention [16, 18], and label viewing [50] improves the capability to make healthy choices [30]. Products with colored nutrition label information are most likely to be chosen [51] and are most effective at promoting a healthier food choice [25]. Colored labels have strong attention-getting properties [51]. Moreover, visualization, realistic pictures, health claims, and cross-branding with healthier foods promote consumer belief that the product is healthier [52]. On the contrary, uncolored or monochromatic labels generate a higher response to be recognized and observed for nutrient levels [53]. The time required to absorb information from the current nutritional table information formats may be another reason why some consumers do not use labels to define their health food choices. Experiments in developing point of choice (POC) labels may assist consumers to select foods appropriate for their needs when they are eating away from home [54]. Consumers demanded a standardized location and format for the labels, as well as simplified information, conveyed using comprehensible terms and statements [32].

Although manufacturers were fully compliant with all relevant legislation and regulations, consumers still perceived labeling as misleading [55]. Consumers believed erroneously that serving sizes were the amount of food that could or should be consumed in one sitting to promote healthy diet guidance [56]. Consumer misunderstanding of serving size values resulted in the purchase and dispensation of excess food, particularly when they were exposed to information that induced an increased serving size [56]. Even when consumers had positive attitudes toward food labels, they were still vulnerable to misuse or being misled by food label

information, especially when they lacked product knowledge [57]. Tonkin et al. found that food system actors had roles which lacked goodwill and violated consumer fiduciary responsibility [58]. Sometimes, the declared value on the label did not accurately reflect the actual nutritional measurements. Recently, a study of five main dining outlets located on a campus in the northeastern United States found that among nine nutritional values, six nutrients (total fat, sodium, protein, fiber, cholesterol, and weight) had more than 10% positive average discrepancies between measured and claimed values [59]. In addition, a study that assessed the performance of 17 laboratories in Thailand discovered that less than 20% demonstrated a good performance in preparing nutrition labels. Common errors included the nutrition information format, estimation of serving sizes, and serving(s) per package [60].

Factors that Affect Nutritional Label Utilization and Healthy Foods Selection

Factors which affected the utilization of nutritional information and the selection process by consumers included nutrition knowledge, gender, age, physical activities, economic status, and ethnicity. Nutritional knowledge had a statistically significant relationship with nutritional label utilization, with a positive effect on the understanding and proper usage of nutritional labels [31, 61]. Moreover, nutrition knowledge also influenced the ability of consumers to process food label data [62]. Consumers with nutritional knowledge use label information effectively by focusing on the salient information, understanding the information, and then making healthy decisions [63]. Prior nutrition beliefs also had an effect on choosing healthier foods [3]. Parental nutrition knowledge was associated with lower body mass index (BMI), waist circumference, and percent body fat of children [45]. It was a common belief that fast food restaurants served meals with higher energy contents [3], and this indicated how the overestimation of energy contents affected consumer's food choices.

Gender differences also contributed to the perceived utilization of nutrition information. Females showed a greater understanding regarding the importance of providing nutrition information [36, 54], and also consumed less energy than males [64]. Females were more concerned about their BMI, and used nutrition label utilization to promote healthier eating and dietary quality [65]. Female respondents utilized food labels [66, 67] and considered calories

more often [68] than males. Nutrition labeling may help to decrease energy intake for females, but it had no effect on males [14].

Moreover, age also determined the effectiveness of nutrition label information utilization by consumers. Nutrition information cannot be effectively utilized by the elderly and there were several areas of misunderstanding [69]. The age of consumers had a negative correlation with the acceptance of nutritional label information [61]. Adolescents had limited abilities to use information from nutrition labels correctly to identify or select healthier foods [70].

Consumers below the poverty line used food labels more often [67], and those with higher socio-economic status (SES) were more concerned about low-fat labels [71]. In terms of ethnicity, Mexican-Americans and other Hispanic groups checked and utilized food labels more frequently than non-Hispanic white men [66]. Non-Hispanic whites also displayed lower knowledge on trans fat [41] which impacted on their fat consumption.

Conclusions

Nutritional label information affected consumer food choice, and utilization of nutritional information allowed consumers to choose healthier foods. Some formats of displaying nutritional information as colored labels and added reference points were most attractive to consumers, and awareness and attention to nutrition information were influenced by nutritional knowledge, gender, age, and socio-economic status. Through understanding the roles of nutrition information, policy makers and related parties can develop better food label formats to help consumers choose healthier foods.

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