Original Article

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Association Between Socio-Demographic Factors; Perception and Use of the Healthier Choice Logo Among Thai Adults

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Abstract:

Objective: This study aimed to determine the socio-demographic factors associated with the perception and use of the Healthier Choice Logo (HCL) among Thai adults.

Material and Methods: This cross-sectional analytic study used secondary data from the 2021 Population Health Behavior Survey conducted by the Thai National Statistical Office, Ministry of Digital Economy and Society, Thailand. Data on the HCL (n=86,230) were analyzed using logistic regression and adjusted for covariates to identify factors associated with the perception and the use of the logo.

Results: Data indicated that 41.5% of participants (n=34,032) understood the HCL on food products and 63.9% (n=21,994) used it when selecting food products. Those with a higher tendency to use it were females (odd ratio (OR) 1.283, 95% confidence interval (CI) 1.279-1.286) and individuals aged over 65 years (OR 1.671, 95% CI 1.661-1.681). Additionally, individuals with tertiary education, those living in Bangkok, unemployed persons, and those with an average income of over 15,000 Thai Baht (THB)/month were more likely to perceive and use HCL. Furthermore, those diagnosed with non-communicable diseases (NCDs) demonstrated a higher perception and use of the HCL (OR 1.017, 95% CI 1.014-1.020).

Conclusion: Socio-demographic factors are associated with the perception and use of the HCL among Thai adults. Promoting the awareness of HCL is recommended to focus on, males, older age groups, and the population with lower education and economic status.

Keywords: healthier choice logo, perception, socio-demographic factors, Thai adults

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Introduction

Non-communicable diseases (NCDs) account for approximately 71% of deaths globally[1] and 70% of all mortality in Thailand. Among the different types of NCDs, the prevalence of diabetes in individuals aged 15 and older rose from 10.9% in 2018 to 15.8% in 2019. Likewise, the prevalence of high blood pressure increased from 27.4% in 2018 to 35.7% in 2019[2]. Diet is a major risk factor that can potentially lead to NCDs[3], mainly due to the shift in dietary behavior from an emphasis on consuming traditionally prepared meals to the increased consumption of packaged and ultra-processed (ready-to-eat) food products that are high in energy, fat, sugar, and sodium[4].

To increase awareness and potentially combat NCDs, nutrition information for specific food products has been conveyed to consumers through each product's nutrition information panel (NIP). However, the NIP format is not always easy to understand, and its information is often displayed on the side or back of a product's package, making it less noticeable or utilized by consumers[5,6]. To alleviate this situation, front-of-pack labeling (FOPL) was designed in a simpler format to aid people with low health literacy in making healthier food choices[7,8]. Consequently, the World Health Organization recommended FOPL as a strategy for reducing unhealthy dietary patterns[9].

Since 2016, Thailand has been implementing a summarized interpretative FOPL under the Healthier Choice Logo (HCL) (Figure 1) to guide consumers to make healthier food choices using a criteria-based nutrition label. However, the use of the HCL in Thailand is not mandatory. Manufacturers wishing to display the logo on their products must meet specific nutrition criteria set for their food group. The criteria were derived from a nutrient profiling method developed by the scientific committee focusing on nutrients to be limited (sugar, fat, and sodium) for reducing risk of NCDs. Food products are categorized into distinct product groups and threshold (cut-off) criteria are determined for each of the product groups (beverages, condiments, dairy products, instant foods, snacks, ice cream, oils and fat, bread, cereal, baked goods, snacks, fish and seafood products, and meat products). The scoring system, including 4 positive nutrients (protein, dietary fiber, calcium, iron) and 4 limited nutrients (total fat, saturated fat, sodium, and sugar) were applied for the ready-to-eat main meal. This strategy encourages product reformulation to include desirable nutrients while keeping undesirable nutrients within acceptable limits, thereby reducing the risk of NCDs associated with poor dietary habits[10]. However, understanding factors that affect the perception and use of the HCL when purchasing food among Thai adults is still limited. To fill this gap, this study aimed to identify specific socio-demographic factors associated with the perception and use of HCL during purchasing food products among Thai adults.

Figure 1 Healthier Choice Logo: a symbol displayed on food products that meet specific criteria regarding sugar, fat, and sodium content within their respective food categories. Source: Notification of the Ministry of Public Health No. 373 (BE 2559)[10]

Material and Methods

Study design and participants

This cross-sectional analytic study used secondary data from the 2021 Population Health Behavior Survey conducted by the National Statistical Office, Ministry of Digital Economy and Society Thailand. Two-stage sampling was applied in this survey. The primary sampling stage comprised provinces with a sub-stratum of within/outside municipal areas. Households comprised the secondary sampling stage, with 16 sample households per sampling province within or outside of municipalities. Data from 84,000 households across Thailand were collected by interviewing every member of a sample household using a structured questionnaire.

In this study, socio-demographic data and lifestyle habits were obtained from 86,230 respondents who were aged over 15 years and responded to the question in the HCL section which contained 2 questions: "Have you ever seen the HCL on a food product?". The respondents could select the answer "yes"/"no"/"not sure". If the answer was "yes", the next question would be asked, "Does the HCL affect your food purchasing decision?". The answer could be "yes"/"no"/"not sure". Ethical approval for this study was given by the Ethics Committee of the Mahidol University Central Institutional Review Board (COE No. MU-CIRB 2024-041.1104).

Data analysis

Statistical analysis was conducted using a statistics program. Categorical data were presented as counts and percentages to characterize participant demographics, including gender, age group, highest education level, region, employment status, income, and health status. Binary logistic regression was used to identify factors associated with the perception and use of the HCL. Two models were analyzed: model 1 (unadjusted) and model 2 (adjusted for covariates). Adjusted odds ratio and 95% confidence intervals were calculated using covariate factors including gender, age, education level, region, employment status, income, and health status. Before analyzing the final model, multicollinearity between independent variables was tested and the correlation coefficient between variables was less than 0.5, meaning a little relationship between variables. Then, all variables were used as adjusted covariates in the final model. Model fit discrimination (goodness of test) was assessed using the Hosmer-Lemeshow goodness-of-fit test. Statistical significance was set at a p-value<0.05.

Results

Characteristic of participants

Among the 86,230 respondents included in this study, 57% were female, 42% were aged 45-64 years, 35% had a primary education, 30% lived in the central region of Thailand, 71% were employed, 23% had an average income over 15,000 Thai Baht per month (THB/month), and 69% reported being in good health (Table 1).

Table 1 Socio-demographic characteristics of study participants

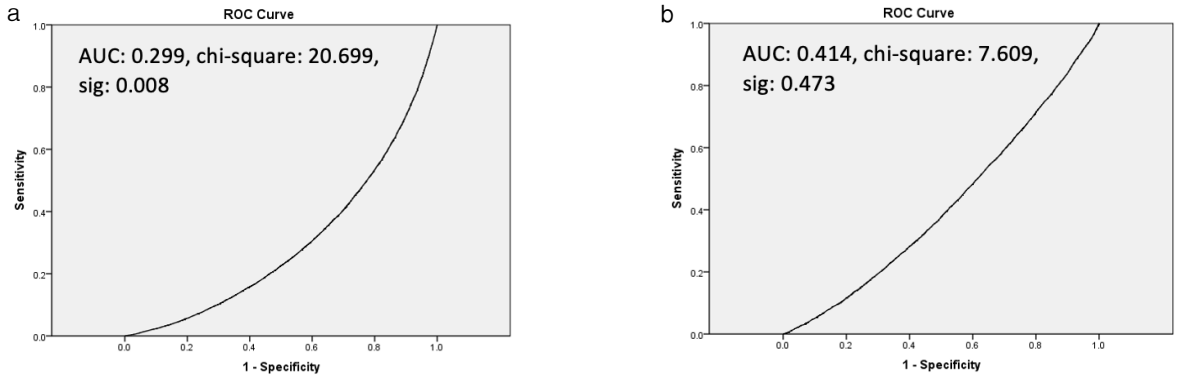
Characteristics	N (%)
Gender	
Female	51,064 (56.8)
Male	35,166 (43.2)
Age group (years)	
15-24	4,606 (8.5)
25-44	21,994 (31.3)
45-64	39,537 (41.6)
≥65	20,093 (18.7)
Education	
Below primary	15,721 (15.7)
Primary	33,363 (35.0)
Secondary	22,796 (30.6)
Tertiary	14,121 (18.4)
Unspecified	195 (0.3)
Region	
Central	24,908 (30.4)
Northeastern	22,359 (26.1)
Northern	20,158 (17.6)
Southern	15,423 (13.1)
Bangkok	3,328 (12.8)

Factors associated with perception and use of the HCL

Among the participants, 41.5% understood the HCL on food packages, and 63.9% used it as a part of their decision-making when purchasing food. Factors associated with the perception and use of the HCL were analyzed using binary logistic regression. This analysis indicated that females were more likely to perceive and use the HCL than males. Individuals aged between 15-24 years were more likely to perceive the HCL than older aged individuals. Conversely, the use of HCL tended to be higher in older age groups, especially in individuals aged over 65 years. Furthermore, individuals with tertiary education, those living in Bangkok, the unemployed, or those with an average income of over 15,000 THB/month were more likely to perceive and use the HCL compared to those with lower education, living in other regions, employed, or having an average income less than 15,000 THB/month. Healthy individuals were more likely to perceive HCL but less likely to use it as part of their decision-making when purchasing food products (Table 2).

Area under curve (AUC) and goodness of fit of the predicted model

Although all variables are significantly associated with the perception of HCL in the Thai population, the model including all variables can predict the perception of HCL poorly indicated by the AUC of 0.299 and Hosmer and Lemeshow test of 0.008. However, the model seemed to perform better for the usage of HCL or food purchasing decisions, indicated by the AUC of 0.414 and the Hosmer and Lemeshow test of 0.473 (Figure 2).



HCL=healthier choice logo, AUC=area under curve

Figure 2 Receiver operating characteristic curves (ROC) for (a) perception and (b) use of HCL for purchasing in Thai population

Table 2 Association between socio-demographic factors and perception/use of HCL as part of decision-making when purchasing food

Variables	Perception of HCL		Use of HCL	
	COR (95% CI)	AOR* (95% CI)	COR (95% CI)	AOR* (95% CI)
Gender				
Male	1	1	1	1
Female	1.304 (1.302-1.306)	1.503 (1.501-1.506)	1.241 (1.238-1.244)	1.283 (1.279-1.286)
Age group (years)				
15-24	1	1	1	1
25-44	0.969 (0.966-0.972)	0.798 (0.796-0.801)	1.177 (1.172-1.182)	1.070 (1.065-1.075)
45-64	0.656 (0.655-0.658)	0.793 (0.791-0.796)	1.304 (1.299-1.309)	1.329 (1.323-1.335)
≥65	0.296 (0.295-0.297)	0.513 (0.511-0.515)	1.456 (1.488-1.464)	1.671 (1.661-1.681)
Education				
Tertiary	1	1	1	1
Below primary	0.155 (0.155-0.155)	0.249 (0.248-0.250)	0.632 (0.629-0.635)	0.554 (0.551-0.557)
Primary	0.264 (0.264-0.265)	0.360 (0.359-0.361)	0.683 (0.680-0.685)	0.653 (0.651-0.656)
Secondary	0.521 (0.519-0.522)	0.594 (0.592-0.595)	0.703 (0.701-0.705)	0.778 (0.776-0.781)
Others/unspecified	0.107 (0.106-0.109)	0.136 (0.134-0.139)	0.277 (0.268-0.286)	0.435 (0.420-0.450)
Region				
Bangkok	1	1	1	1
Central	0.533 (0.531-0.534)	0.612 (0.610-0.614)	0.593 (0.591-0.595)	0.621 (0.619-0.623)
Northern	0.410 (0.409-0.411)	0.615 (0.613-0.617)	0.857 (0.853-0.861)	0.951 (0.947-0.955)
Northeastern	0.589 (0.587-0.590)	0.943 (0.941-0.946)	0.837 (0.834-0.840)	0.954 (0.950-0.957)
Southern	0.512 (0.510-0.513)	0.629 (0.627-0.631)	0.869 (0.865-0.873)	0.940 (0.935-0.944)
Employment status				
Unemployed	1	1	1	1
Employed	1.389 (1.386-1.391)	0.929 (0.926-0.931)	0.994 (0.991-0.997)	0.974 (0.971-0.978)
Income (THB/month)				
≥15,000	1	1	1	1
8,500-14,999	0.585 (0.583-0.586)	0.803 (0.801-0.805)	0.762 (0.759-0.764)	0.884 (0.881-0.887)
5,000-8,499	0.440 (0.439-0.411)	0.676 (0.674-0.678)	0.758 (0.752-0.758)	0.846 (0.843-0.849)
2,600-4,999	0.348 (0.347-0.349)	0.586 (0.585-0.588)	0.771 (0.768-0.775)	0.809 (0.805-0.813)
<2,600	0.264 (0.263-0.264)	0.490 (0.488-0.492)	0.737 (0.734-0.740)	0.754 (0.750-0.758)
No income	0.522 (0.520-0.524)	0.608 (0.606-0.611)	0.756 (0.753-0.760)	0.828 (0.824-0.833)

Table 2 (continued)

Variables	Perception of HCL		Use of HCL	
	COR (95% CI)	AOR* (95% CI)	COR (95% CI)	AOR* (95% CI)
Health status				
Healthy	1	1	1	1
Diagnosed NCDs	0.579 (0.578-0.580)	0.897 (0.895-0.898)	1.076 (1.073-1.079)	1.017 (1.014-1.020)

COR=crude odds ratio, AOR=adjusted odds ratio using gender, age, education, region, employment status, income, and health status, 95% CI=95% confidence intervals, HCL=healthier choice logo, NCDs=non-communicable diseases, THB=Thai Baht

Discussion

This study identified factors associated with the perception and use of the HCL among Thai adults (aged 15 and over) who participated in the 2021 Population Health Behavior Survey. While the original survey design provided robust analytical data potentially representative of the Thai population, data for this present study included 86,230 respondents aged 15 years and over who answered FOPL questions, accounting for 52.4% of this demographic group. Based on this sample, the perception of the HCL was relatively low (41.5%). However, among those who perceived the label, 63.9% used it as part of their decision-making process when purchasing food. The low self-reported perception of the HCL indicates that most Thai participants in this study were unaware of this nutrition symbol on food packages, necessitating further investigation into the reasons. Nonetheless, the study results indicate that even moderate use of HCL labeling assists consumers in making informed food purchases, suggesting the potential utility of this logo in promoting healthier food choices. Moreover, this study was limited in addressing the degree of understanding and reasons for using or not using the HCL due to constraints in the original survey, which focused on various health behaviors. Further research should explore these aspects more comprehensively.

This study determined that socio-demographic factors were associated with the perception and use of HCL. Women, known to have a greater interest in healthy eating habits, had more opportunities to access nutrition labels[11] as reported by Cheah, et al.[12], a finding supported by this present study. Individuals aged >24 years showed higher awareness of the HCL compared to other age groups. However, while older age groups were less likely to perceive the HCL, they tended to use it more in their purchasing decisions than younger age groups. The perceptions of older age groups may be influenced by visual status impairment, yet they exhibit greater health consciousness compared to younger age groups[13]. Adjustments in the positioning and size of the logo could better facilitate its use among this older population. Additionally, it is worth nothing that elderly individuals may be more accustomed to fresh market foods rather than packaged products with nutrition labels, which could contribute to their lower awareness of the HCL.

This study indicated that the awareness and utilization of FOPL were low among individuals with low education and low economic status. Roark et. al reported that participants with low educational and low economic status tended to have more exposure to FOPL than those with high education and economic status[14], which contradicts the findings of this study. FOPL was developed because the original nutrition

facts panel was incomprehensible to most consumers. The HCL was designed as an easy-to-understand label that could assist consumers across socioeconomic statuses in making healthier dietary choices[15]. The results of this study suggest that the use of FOPL in Thailand has not been effective in reaching low socioeconomic populations. Strategies are needed to improve the communication of nutrition labeling, including the HCL, to reach individuals with lower education and economic backgrounds. Additionally, this study indicates that employed individuals were less likely to perceive and use HCL, which contradicts findings by Cheah et al[12]. Since this study includes students in the unemployed group, these individuals may have greater access to health knowledge compared to other population groups.

People diagnosed with NCDs showed higher awareness and use of the HCL compared to those in good health. One likely reason is that this group must actively control or limit their food intake based on their illness or health condition. Therefore, the HCL, indicating that a product meets the criteria for sugar, fat, and sodium contents, assists them in making informed food purchasing decisions. Healthy participants, however, were more likely to perceive the HCL, but less likely to use it, possibly because they do not perceive certain foods and their contents as posing health threats. Addressing this point is crucial for identifying strategies to encourage this "healthy" population group to recognize the benefit of the HCL in promoting healthier food choices and preventing NCDs.

This study was a cross-sectional analytic study; hence, it cannot establish causality, which requires further research. In addition, since self-reported interviews used in this study may have errors regarding the utilization of the HCL, additional methods such as observing actual food purchasing behaviors, conducting eye-tracking experiments, or simulating food product choices in the laboratory setting should be considered. Moreover, the models used for analysis still have limitations in reflecting the perception and utilization of HCL, which may relate to other relevant factors, such as dietary behaviors, surrounding food stores, or even marketing factors. Further studies are also needed to explore consumer understanding of FOPL in greater depth and to understand why individuals who perceive the HCL choose not to use it when selecting food products. Such endeavors will assist policymaking and in developing strategies to enhance the effectiveness of the HCL and promote healthy food choices and eating behaviors.

Conclusion

Socio-demographic factors are associated with the perception and use of HCL among Thai people. Males, individuals aged over 65 years, below primary education, lived in the central region, employed, average income less than 2,600 THB/month, and diagnosed NCDs who may have a lower level of the perception should be focused on improving label awareness to promote healthier food choices through the HCL.

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Conflict of interest

There are no potential conflicts of interest to declare.

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