

NUTRITIONAL TRAFFIC LIGHT LABELLING: DRIVERS AND OUTCOMES

D. W. A. Gooneratne^{1,*}, M. M. Shamil² and M. F. F. Fasna³

^{1, 2, 3} Department of Commerce and Financial Management, Faculty of Commerce and Management Studies, University of Kelaniya, Sri Lanka

*Corresponding author (email: dulniwanya@gmail.com)

INTRODUCTION

The increasing demand for a healthy lifestyle has brought about the use of labels to assist consumer decision-making by alleviating information asymmetry. The front-of-package labels are actions taken to improve the food environment by lessening the impacts of Non-Communicable Diseases (NCDs) (Jauregui et al., 2020). Diabetes has doubled from 1980-2014, whereas the prevalence of obesity has tripled since 1975. Diabetes, obesity, and other chronic diseases are primarily driven by consumers' unhealthy food consumption patterns, including sugar-loaded soft drinks. Nevertheless, the Nutritional Traffic Light (NTL) labeling related to carbonated sweetened beverages remains in its infancy, and limited evidence is available in the literature when analyzing its impacts on consumption patterns globally (Gupta et al., 2020; Reboucas, 2019). Sri Lanka, as the study context, was driven by several factors. WHO (World Health Organization) has identified Sri Lanka as a developing country with 11.3% of diabetic patients in the 20-79 as of 2021. Therefore, to minimize the threat and prevalence of potential NCDs and to educate consumers on the nutritional value of packaged food, the Ministry of Health introduced the NTL colour coding system for the soft drinks industry in 2016. The NTL label is a novel concept in the carbonated soft drinks industry to support consumers to buy healthy food and maintain better health, which is relatively underexplored in the Sri Lankan context. Therefore, this study aims to shed light on the consumer-related drivers affecting the attitude toward NTL labeling and its impact on purchase intention among soft drinks consumers in the western province of Sri Lanka.

Our study has the following contributions. Firstly, this is one of the early studies to determine the drivers that affect the attitude toward NTL labeling and its impact on the consumers' purchase intentions in the Sri Lankan context. Secondly, the study expects to draw the attention of policymakers to the need to improve nutrition awareness programs aiming NDCs and NTL labeling to enhance consumers' knowledge, consciousness, and nutrition self-efficacy (Madhusanka et al., 2021). Thirdly, the findings are imperative for marketers and manufacturers to invest more time and resources in developing soft drinks with low sugar levels.

METHODOLOGY

After an extensive literature review, the study develops its theoretical model (Figure 1) by incorporating three drivers: health consciousness, nutrition knowledge, and nutrition self-efficacy.

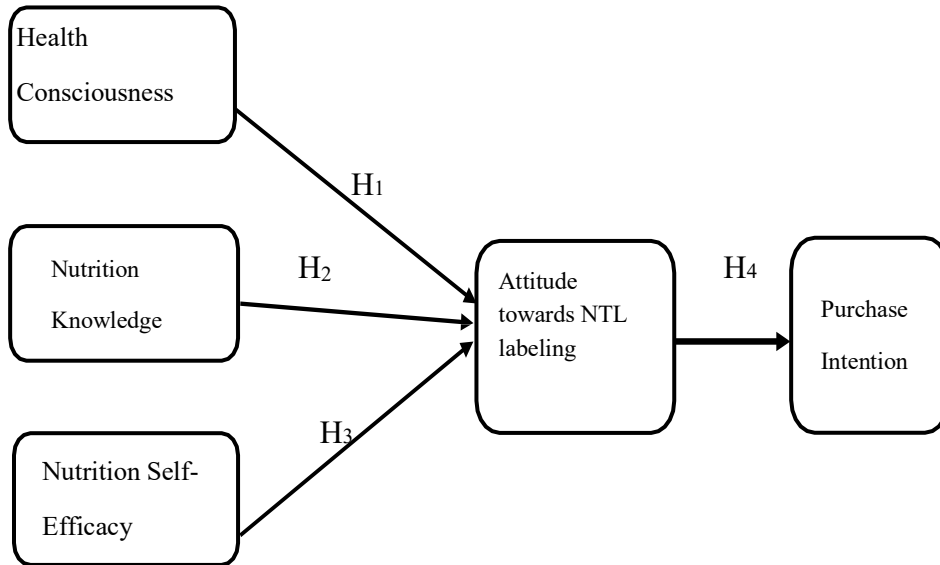


Figure 1 Conceptual Framework

Health consciousness is the willingness to focus on one's self, actions, thoughts, or emotions related to health and the readiness to commit to healthiness-promoting behaviours. Prior studies have indicated that health consciousness positively influences the attitude towards nutrition labels (Satia et al., 2005). Nutrition knowledge also creates a path and allows consumers to keep information related to nutrition or health facts in mind, which may improve decision-making concerning food label use and dietary habits and understanding nutrition labels correctly. Moreover, prior studies found that nutrition knowledge positively affects attitude towards the nutritional label (Zainol et al., 2021). Linde et al. (2006) have asserted that people with a high level of self-efficacy are highly motivated to engage in health and diet-related activities vis-à-vis people with low self-efficacy levels. Hence it is a more significant predictor of health outcomes. Extant literature reveals that nutrition self-efficacy positively influences consumer attitudes (Anderson et al., 2007; Hsien et al., 2015). A consumer's attitude has been a crucial concept in behavioural studies and has played a vital role in consumer purchase intentions (Kodali & Telaprolu, 2017). Previous literature findings revealed that attitude toward nutritional labelling positively influences consumer purchase intentions (Grummon & Hall, 2020; Reboucas et al., 2019). Therefore, the current study has identified the following hypotheses for the present study.

- H₁: Health consciousness has a positive influence on attitude towards NTL labelling
 H₂: Nutrition knowledge has a positive influence on attitude towards NTL labelling
 H₃: Nutrition self-efficacy has a positive influence on attitude towards NTL labelling
 H₄: Attitude towards NTL labeling positively influences purchase intention of soft drinks

The study employs a deductive approach with a cross-sectional design commonly used in similar consumer behavior-related studies (Kodali & Telaprolu, 2017). The study population consists of soft drink consumers living in the Western province of Sri Lanka, given it is the first-level administrative division and the most populated region with the highest median monthly income per person in Sri Lanka. The study sample was limited to 200 soft drink consumers in the Western province with the restrictions experienced amidst the fourth wave

of the Covid-19 Pandemic. The convenience sampling technique was adopted due to the unavailability of a sample frame. A quantitative research design was employed where primary data were collected using a self-administered questionnaire. The reliability and validity of the constructs were examined, and the reliability coefficient and AVE of the constructs were above the threshold levels ($\alpha > .70$, $CR > .70$). The discriminant validity was also confirmed as the square root of the AVE of variables are higher than the correlation between variables. Multiple logistic regression analysis was employed to test the first three hypotheses. Multinomial logistic regression was used to test the fourth hypothesis, given that purchase intention is a nominal categorical variable.

RESULTS AND DISCUSSION

Amongst the respondents, it was noted that 72.7%, 15.3%, and 11.9% of respondents were from Colombo, Gampaha, and Kalutara districts, respectively. 60.8% of the sample were females, and 39.2% were males. Most of the respondents (75.6%) were between 20 - 30 years, 17.6% were in the 30 - 39 age category, and 6.8% were in the 40 - 49 age category. Before applying the multiple regression, data were tested for residual normality, linearity, and heteroscedasticity. The Durbin Watson test results suggested autocorrelation was absent, given that the coefficients are within the 0-4 range (Gujarati, 2009). The threat of multicollinearity was unlikely since Tolerance ($< .1$) and VIF (.10) were within the accepted range. Table 1, the Adjusted R² value shows that the independent variables explain 40.3% of the attitude towards NTL labelling variance. The regression results depict a positive and significant effect of nutrition self-efficacy on the attitude toward NTL labelling ($\beta = 0.377$, $p < .05$), which supports hypothesis - H1. This is consistent with the study findings by Hsien et al. (2015), who asserted that nutrition self-efficacy positively affects attitude towards nutrition labels.

Further, a significant positive relationship was observed between nutrition knowledge and the attitude towards NTL labeling ($p < .05$), consistent with the hypothesis - H2. The results are similar to previous findings of Zainol et al. (2021), who found a positive effect of nutrition knowledge on attitude towards nutrition labels. Furthermore, a significant positive relationship between health consciousness and attitude towards NTL labelling was identified ($\beta = 0.213$, $p < .05$), supporting the hypothesis - H3. The findings comply with study results by Satia et al. (2005), who illustrated that health consciousness positively affects attitude towards nutrition labels. Consequently, the study results depict that nutrition self-efficacy, nutrition knowledge, and health consciousness of consumers are the key drivers of attitude toward NTL labeling; thus providing nutritional information about products can steer consumers to make healthier food choices.

The Multinomial Logistic Regression analysis (Table 1, Model 2) was used to predict the effects of attitude towards labelling on purchase intention. The Chi-square value of 8.837 suggests a significant relationship between the purchase intention and attitude towards NTL labelling. The test results support hypothesis - H4. This study's findings support previous findings of Grummon & Hall (2020). Further, Cox and Snell R² suggest that attitude towards NTL labelling explains 4.9% of the variability of purchase intention. In contrast, Nagelkerke R² posits that attitude towards NTL labelling explains 5.7% of the variation in the purchase intentions of the customers.

Table 1 Regression results

Model 1 (Multiple Regression)	
Constant	0.742
Health Consciousness	0.207* (0.072)
Nutrition Knowledge	0.198* (0.065)
Nutrition Self-Efficacy	0.343* (0.060)
Adj. R ²	0.413
F value	40.311
p-value	0.000
Model 2 (Multinomial Logistic Regression)	
Model coefficient χ^2	8.837
Significance	0.012
Cox and Snell R ²	0.049
Nagelkerke R ²	0.057

Notes: *, ** indicates significance at the 5% and 10% levels, respectively (2-tailed). Standard error in parenthesis.

CONCLUSIONS AND IMPLICATIONS

The study's findings reveal that nutrition self-efficacy, knowledge, and health consciousness drive the attitude towards NTL labelling. Similarly, attitude toward NTL labelling had a significant favorable influence on purchase intention. The study findings are imperative to understand consumers' attitudes towards NTL labelling, a relatively novel concept in Sri Lanka. Further, the study's outcomes have several implications for manufacturers and marketers of the non-alcoholic beverage industry. The study result indicates that consumers often make informed decisions given their preference to consume soft drinks with low sugar levels, making it vital for the industry to invest more resources and time in making low-sugar beverages to reach new market segments. Policymakers and other Health authorities may use primary healthcare facilities to undertake awareness programs on food labelling and its advantages to enhance consumer knowledge, shape their behaviour and make them more health-conscious to prevent lifestyle-related disorders. Nutrition labelling awareness campaigns, in conjunction with complementary strategies such as pricing strategies aimed at the population that is less aware of NTL, could further promote healthier beverage consumption in the context of Sri Lanka. This is imperative as Sri Lanka is a developing economy with a relatively higher diabetic prevalence rate which is on the verge of increasing. The current research has certain limitations. The study sample is limited to the Western province of Sri Lanka and employed the convenience sampling technique given the difficulties experienced when collecting data amidst the fourth wave of the Covid-19 pandemic in Sri Lanka. Hence, there can be limitations in generalizing the study findings to the entire population. Moreover, further research may uncover more self-regulation drivers since this study only examined three individual-level self-regulation variables to assess attitudes toward NTL labelling. Further, future studies could incorporate traffic light labels available on solid food items to identify the impact on purchase intention or to determine whether the public is aware of multiple traffic light labelling on solid food and beverages.

Keywords: Health consciousness, nutrition knowledge, nutrition self-efficacy, nutrition traffic light labeling, purchase intention

REFERENCES

- Anderson, E. S., Winett, R. A., & Wojcik, J. R. (2007). Self-regulation, self-efficacy, outcome expectations, and social support: social cognitive theory and nutrition behavior. *Annals of behavioral medicine*, 34(3), 304-312. <https://doi.org/10.1007/BF02874555>
- Gupta, A., Billich, N., George, N. A., Blake, M. R., Huse, Backholer, K., Boelsen-Robinson, T. & Peeters, A. (2021). The effect of front-of-package labels or point-of-sale signage on consumer knowledge, attitudes and behavior regarding sugar-sweetened beverages: a systematic review. *Nutrition Reviews*, 79(10), 1165-1181. <https://doi.org/10.1093/nutrit/nuaa107>
- Grummon, A. H., & Hall, M. G. (2020). Sugary drink warnings: A meta-analysis of experimental studies. *PLOS Medicine*, 17(5), 1-21. <https://doi.org/10.1371/journal.pmed.1003120>
- Jáuregui, A., Vargas-Meza, J., Nieto, C., Contreras-Manzano, A., Alejandro, N.Z., Tolentino-Mayo, L., Hall, M.G. & Barquera, S. (2020). Impact of front-of-pack nutrition labels on consumer purchasing intentions: a randomized experiment in low-and middle-income Mexican adults. *BMC Public Health*, 20(1), 1-13. <https://doi.org/10.1186/s12889-020-08549-0>.
- Kodali S, & Telaprolu N. (2016). Food label and its influence on consumer buying behavior: A review of research studies. *International Journal of Science and Research*, 7(1): 386-390. <https://doi.org/10.21275/ART20182842>
- Linde, J. A., Rothman, A. J., Baldwin, A. S., & Jeffery, R. W. (2006). The impact of self-efficacy on behavior change and weight change among overweight participants in a weight loss trial. *Health Psychology*, 25(3), 282–291. <https://doi.org/10.1037/0278-6133.25.3.282>
- Madhusanka, S. A. C., Rathnayake, K. K. H. M., & Mahaliyanaarachchi, R. P. (2021). Impact of traffic light food labeling on consumer awareness of health and healthy choices of the point-of-purchase. In Conference Proceedings of the International Conference on Agriculture, Food Security and Safety (AgroFood) 2021, 2(1), 1-14.
- Rebouças, M.C., Rodrigues, M.d.C.P. and Freitas, S.M.d. (2019), "How label and nutritional claims affect consumers' acceptance, buying intention and quality perception toward a beverage made from cashew nut", *Nutrition & Food Science*, 49(6), 1243-1251. <https://doi.org/10.1108/NFS-11-2018-0309>.
- Satia, J., Galanko, J., & Neuhaus, M. (2005). Food nutrition label use is associated with demographic, behavioral, and psychosocial factors and dietary intake among African Americans in North Carolina. *Journal of the American Dietetic Association*, 105(3), 392–402. <https://doi.org/10.1016/j.jada.2004.12.006>

Zainol, N. U., Kowang, T. O., Hee, O. C., Fei, G. C., & Kadir, B. Bin. (2020). Managing Organizational Change through Effective Leadership: A review from literature. *International Journal of Academic Research in Business and Social Sciences*, [online] 11(1). <https://doi.org/10.6007/ijarbss/v11-i1/8370>.