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Responsible Marketing in the Traffic Light Labeling of Food Products in Ecuador: Perceptions of Cuenca Consumers

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Abstract: Responsible marketing (RM) helps companies make products that improve people's lives and is in line with public policies that provide a positive impact on society; an example of this is traffic light nutritional labelling (TLNL). Ecuador was a pioneer in Latin America in the mandatory implementation of TLNL. For this reason, this research aimed to analyze RM in the TLNL of food products from the perception of consumers in the urban area of Cuenca, Ecuador. Specifically, the research aimed to answer: What is the degree of consumer understanding of TLNL in the urban area of Cuenca, Ecuador? A cross-sectional investigation was undertaken, with 384 surveys conducted. A chi-square test (χ^2) was performed, which showed the relationship between variables reflecting RM knowledge and the understanding and use of TLNL. An ordinal logit model (OLM) was applied, showing that the variables of education, knowledge of labeling, and knowledge of marketing were associated with a greater probability of having some level of understanding of TLNL. Finally, a binomial logit model (BLM) revealed that the variables of income level, knowledge of TLNL, illnesses, confidence in TLNL, the influence of COVID-19 on eating habits, and knowledge of marketing were associated with people being more likely to use TLNL. RM is present in the TLNL through the clear and understandable dissemination of information.

Keywords: responsible marketing (RM); traffic light nutritional labelling (TLNL); consumer; Ecuador

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1. Introduction

Marketing is defined as a group of social and administrative processes for the creation, communication, sale, and exchange of products with value for different interest groups [1–3]. In addition, it can have a negative influence on consumer purchasing decisions, for example, through misleading advertising and promotion, taking advantage of the essence of the brand and psychologically incentivizing purchase instead of highlighting the true attributes of the product, as well as through the encouragement of excessive consumerism and the use of advertising with stereotypes [4–7]. Regarding the sale of food products, non-responsible marketing can contribute to poor information on processed and ultra-processed foods, which are associated with non-communicable diseases (NCDs) linked to diet, including cardiovascular diseases, cancer, respiratory diseases, and diabetes, which constitute the main cause of death worldwide, affecting approximately 41 million people per year [8–12].

Due to the aforementioned concerns, through its various agencies, the United Nations has created guidelines for consumer protection. Such is the case of the Codex Alimentarius Commission, which was created by the Food and Agriculture Organization of the United

Nations (FAO) and the World Health Organization (WHO) in 1963 in order to establish international standards for food aimed at protecting the health of consumers and ensuring fair practices in the food trade [13,14]. In addition, Codex deals with the standard for food labeling [11], which aims to ensure fair practices in the sale of food and guide and provide consumers with all of the relevant information to make good product choices [11,13,14]. Moreover, at the United Nations General Assembly on 16 April 1985, the Guidelines for Consumer Protection were adopted, which comprise a set of principles that establish how member states should raise awareness among organizations, governments, and civil society to protect consumers against the acquisition of goods and services [15]. However, both the Codex Alimentarius standards and the Guidelines for Consumer Protection are recommendations that member states must apply on a voluntary basis, adopting legal protection measures for consumers according to their needs [13,15]. In Ecuador, the Organic Law for the Defense of the Consumer was created, which aims to mediate between distributors and consumers, promoting knowledge and safeguarding the rights of consumers, in addition to ensuring safety and equity between both parties. Within the considerations established in said law, it is highlighted that the state must guarantee the availability of quality public or private products and that the information presented in them must be truthful [16].

Consequently, responsible marketing (RM) complies with the standards and guidelines established by the United Nations [13,15]. It includes social responsibility values based on the activity of the company [17,18] and attempts to improve the impact that companies have on society through their activities, creating products that can contribute to improving people's lives [3,14,19–23]. In addition, it is oriented toward aspects of human rights, the environment, community growth, and public health [24]. RM practices include teaching people about the effects of their consumption habits, good sales practices, integrity, and product safety, as well as the correct labeling of products [17,18,25]. Therefore, the dissemination of clear and understandable information regarding the labeling and advertising of food is considered a RM strategy [17,18,26–28]. However, due to the difficulties people can experience in understanding nutritional information, it is suggested that when making changes to nutritional labeling, these give rise to significant contributions that improve consumer understanding and lead them to purchase healthier choices [29]. For this reason, the clear labeling of food emerges as a simple instrument to warn consumers about food products that may affect their health, enabling them to make easy purchase choices by having access to understandable nutritional information. This labelling also helps consumers avoid the consumption of foods that contain high levels of sugar, fat, and sodium, thus contributing to the reduction of NCDs, which are responsible for more than 80% of deaths per year globally [12–14,30,31]. Among the types of frontal nutritional labeling, the following stand out: (i) approval systems, in which seals or logos are used to increase the purchase of endorsed foods, such as the green lock or the option lock; (ii) summary systems, which reveal the global score of a healthy product in terms of the five possible scores of the Nutri-Score or the 10 possible scores in the Health Star Rating; (iii) monochromatic guides for daily quantity systems: a small representation of the nutritional information of a product used by the processed food industry to indicate the number of calories and the amounts of various nutrients, along with their percentage contributions to diet; (iv) front labeling of the reference intake or a color-coded daily quantity system made up of three colors according to the nutrient content (red, amber, or green, for a high, medium, or low level of nutrients, respectively); (v) color- and text-coded nutrient systems or the nutritional traffic light, which provides textual information related to color codes that indicate the level of nutrients; (vi) "High/Excessive" warning systems, which use text-based octagon-shaped stamps to inform consumers about a product with excessive nutrients [32].

In this context, several countries around the world have undertaken initiatives to implement public policies aimed at improving the food culture of consumers and reduce the excessive consumption of processed foods that can cause disease. Among these initiatives is the application of frontal nutritional labeling on a voluntary or mandatory basis [10,33].

Of the 194 countries in the world, only 38 (20%) use or are about to use frontal nutritional labeling. Of these, 74% apply it voluntarily (n = 28), 21% by mandate (n = 8), and 5% voluntarily and by mandate (n = 2) [34].

The WHO has commented on the importance of using frontal nutritional labeling under the health emergency situation caused by COVID-19 (coronavirus disease 2019), as the risk factors for NCDs related to poor diet can contribute to additional health complications if the coronavirus is contracted [32]. The WHO recommends the consumption of a variety of foods—where fruits and vegetables predominate—reducing the consumption of salt, sugar, and fat, and providing information on food labels to increase consumers' ability to choose healthy products [35].

In 2013, Ecuador implemented mandatory traffic light nutritional labelling (TLNL) as a public policy, becoming the first country in South America to apply such labeling. TLNL was implemented in order to improve the food safety and health of the population, reduce NCDs related to poor diet, improve consumer knowledge, and increase the accurate perception of food products and their impacts on human health [10,36]. In addition, TLNL is accepted by consumers, due to the ease of understanding it and the simple interpretation that it provides, helping them to distinguish healthy foods from those that are not [37,38].

Traffic light labeling of food products is a tool that provides information to the consumer about the quality and nutritional value of food. In addition, it allows you to compare this information between similar products. Therefore, the main objective of this research was to analyze the RM in the TLNL of food products based on the perceptions of consumers in Cuenca, Ecuador. The research question that was raised was the following: What is the degree of understanding of the traffic light nutritional labeling of consumers in the urban area of the Cuenca canton? The results offer insights into how TLNL impacts consumers and provide a foundation for future scientific research.

2. Materials and Methods

2.1. Location of the Study Area

The present study was carried out in the urban area of the Cuenca canton, which is the capital of the province of Azuay, located in the Sierra region of Ecuador at 2550 m above sea level. The urban area is traversed by four rivers: Machángara, Tarqui, Tomebamba, and Yanuncay [39,40]. In the urban area of Cuenca, there are a large number of organizations contributing to economic activity at the provincial level, including services, commerce, manufacturing, transportation, construction, and personal services [39].

2.2. Data Collection

The research involved cross-sectional data collection, which examines the variables at a certain time across a sample population [41]. The sample was selected using a stratified random sampling method with proportional allocation, according to the most recent census carried out in Ecuador by the National Institute of Statistics and Censuses (INEC) in 2010 [42]. The representative sample was calculated to consist of 384 surveys, with a confidence level of 95% and a precision rate of 5%. A pilot study was undertaken before the final survey in order to refine the survey questions. The final survey was conducted in person to ensure timely information and reliable results. The surveys were applied randomly in the most frequented supermarkets in different parts of the urban area of the canton of Cuenca [43–45], as shown in Table 1. The surveys were carried out on different days of the week and at different times of the day to ensure a random stratified sample of people. The survey was conducted between the months of May and June 2021, complying with the respective biosafety measures related to COVID-19. However, some of the people surveyed were not comfortable participating.

Table 1. Description of the sample size.

Names	Strata	Number of Supermarkets'	Proportion of Sample Population	Sample Population (N)
Coral Hypermarkets	1	7	37%	142
Supermaxi	2	4	21%	81
Aunt Warehouses	3	3	16%	61
Gran Akí	4	2	11%	40
South Mega Store	5	1	5%	20
Mega Supermarket Santa Cecilia	6	1	5%	20
People's Commissariat	7	1	5%	20
Total		19	100%	384

Source: Authors' own elaboration, adapted from "Analysis of the value chain in the supermarkets and hypermarkets sector of Cuenca canton and generation of competitive strategies in the Supermaxi and Gran Akí case", by Álvarez, 2019. "Relational marketing and business management "Success Strategy". Case of the supermarket industry in Cuenca", by Córdova and Escandón, 2018.

2.3. Questionnaire

The survey questionnaire collected information on sociodemographic variables, food buying habits, and knowledge, use, and understanding of the traffic light nutritional labeling, among other information. Previous studies were used as a reference to develop the questions [46–49].

2.4. Data Analysis

Firstly, a descriptive analysis of the most relevant variables for the study was carried out. Secondly, a chi-squared (χ^2) analysis was used to evaluate the relationship between knowledge of RM and sociodemographic characteristics, understanding, and use of the TLNL. The null hypothesis was that there was no association or dependence between the variables [50,51]. Thirdly, an ordinal logit model (OLM) was constructed to analyze the level of understanding of the nutritional traffic light system. The dependent variable to be analyzed was qualitative and ordinal in nature; therefore, it was transformed into a quantitative value of 0, 1, 2, 3, . . . , j in relation to a J [52–54]. The dependent variable was coded into four categories in ascending order, namely 0: does not understand, 1: low level of understanding, 2: medium level of understanding, 3: high level of understanding. The model formula was the following:

$$Y_i^* = X_i\beta + \varepsilon_i, \quad (1)$$

where i is the observation, β is the regression of coefficients for X, and ε is the identical and independent random error term [52,55,56].

The variable Y_i is a function of the variable Y_i^*, according to the choice of consumers i between the options (0, 1, 2, 3, ... , j) and in relation to several threshold points μ_k. The level $k = 1$ is the minimum threshold (level of understanding (LU)); this is represented as [54]:

$Y = 0$ does not understand if $Y^* \leq \mu_1$;
$Y = 1$ under LU if $\mu_1 \leq Y^* \leq \mu_2$;
$Y = 2$ mean LU if $\mu_2 \leq Y^* \leq \mu_3$;
$Y = 3$ high LU if $Y^* > \mu_3$.

Finally, a binomial logit model (BLM) was used to analyze the use of TLNL. This was a dichotomous dependent variable that took a value of 0 to indicate that the respondent does not use the traffic light labeling system or 1 to indicate that the participant does use the traffic light labeling [52,57–59]. The BLM is written in the following way [52,55,58]:

$$P_i = \frac{1}{1 + e^{-Z_i}} = \frac{e^Z}{1 + e^Z}, \quad (2)$$

where the independent variables are $Z_i = \beta_1 + \beta_2 X_i$ and X_i. Z_i is between the range $-\infty$ and $+\infty$, and the probability that people use the TLNL is between zero and one.

The parameters of the models were estimated using the maximum likelihood estimation (MLE) method and, moreover, the significance levels of the models used in this study for acceptance and rejection of the null hypothesis were 0.01, 0.05, and 0.10, respectively. The STATA® 16 statistical package was used to conduct the analysis.

3. Results

The aim of this study was to analyze RM in terms of the traffic light labeling of food products, from the perspective of consumers in Cuenca, Ecuador. Firstly, the descriptive statistics will be presented. Secondly, the results of the association between participants' knowledge of RM with respect to sociodemographic variables, the level of understanding, and the use of the TLNL, analyzed using chi-squared (χ^2) test, will be presented. Finally, the results of the ordinal logit model (OLM) and the binomial logit model (BLM) will be shown to uncover the variables that affect the understanding and use of the TLNL system, respectively.

3.1. Descriptive Statistics

The study was carried out in the urban area of the Cuenca canton, Ecuador, with a sample of 384 surveys. Table 2 shows the summary descriptive statistics for the study variables of the entire dataset. All survey participants were between the ages of 18 and 70, of which approximately 63% were women and 38% were men. In addition, approximately 67% stated their marital status as single, 28% were married or in a common-law union, and 6% were divorced or widowed. Almost 52% stated that their households were comprised of between four and six members, and 39% between one and three members. Additionally, approximately 63% of the respondents stated that they had achieved higher education, 33% secondary education, 4% primary education, and only a small percentage of respondents indicated that they had no academic training (0.52%). Most (61%) indicated that they work, and 39% were not working. In addition, 27% reported a monthly income level in dollars ranging between $201 and $400, 25% had an income between $401 and $600, 24% between $0 and $200, 10% between $601 and $800, 8% between $801 and $1000, and 7% indicated that they had an income of more than $1000. Regarding food expenses, 42% of those surveyed spent between $1 and $50, 33% between $51 and $100, 15% between $101 and $150, and 9% more than $150. Regarding the frequency of food purchases, 6% stated that they bought food daily, 55% weekly, 27% fortnightly, 11% monthly, and just over 1% otherwise. Approximately 98% made their food purchases physically, while a small number of respondents indicated that they made purchases virtually (1%) or otherwise (0.78%). Almost half indicated that the price of food was the most important factor when buying food (49%); in turn, 33% considered health and 19% the brand of the product or another factor as the most important factor when purchasing food.

Regarding the TLNL, 97% of the people surveyed knew it existed. Regarding the type of labels that the processed products use, 48% stated that they could better interpret the TLNL, while 11% preferred the label that contains the nutritional information; 38% used both labels, and a small percentage used neither (3%). The majority (65%) of the people surveyed had confidence in the TLNL, although only 58% reported using it. Of these, 54% stated that they use it to have information about the foods they consume, and 74% stopped consuming a food after reading the sugar, salt, and/or fat content. Regarding the understanding of TLNL, 40% of the respondents had a high level of understanding, 51% a medium level, 7% low, and 2% did not understand. In addition, 96% indicated that the TLNL helps them identify healthy foods from unhealthy ones. Most (88%) respondents knew the meaning of "processed foods" and tended to use the TLNL to understand dairy products (20%), snacks (19%), soft drinks (16%), and cereals (14%) (Figure 1). Disease of any type was present in 20% of respondents. Additionally, 71% of those surveyed reported that the COVID-19 pandemic had affected their eating habits. Approximately 86% understood what marketing is, and 71% understood RM. Finally, it is important to mention that 82%

of the people surveyed had been positively influenced due to the COVID-19 pandemic, consuming less junk food (40%), having a balanced diet (34%), and drinking enough water (22%), among other new habits (5%) (Figure 2).

Table 2. Descriptive statistics of the variables.

Independent Variables	% of the Sample Population	Frequency	Average	S.D.	Min.	Max.
Quantitative						
Age:			28	9	18	70
Qualitative						
Sex:			0.38	0.49	0	1
Woman	62.5	240				
Man	37.5	144				
Marital status:			0.604	1.10	0	4
Single	66.67	256				
Married	20.57	79				
Divorced	5.47	21				
Widower	0.26	1				
Free Union	7.03	27				
Number of household members:			0.69	0.62	0	2
1–3	39.32	151				
4–6	52.34	201				
More than 7	8.33	32				
Education:			2.62	0.66	0	4
No instruction	0.52	2				
Primary school	4.17	16				
High school	32.55	125				
Third level	58.85	226				
Fourth level	3.91	15				
Work:			0.61	0.49	0	1
Do not work	39.32	22				
Does work	60.68					
Monthly income:			1.71	1.46	0	5
$0–$200	23.96	92				
$201–$400	26.56	102				
$401–$600	25	96				
$601–$800	10.16	39				
$801–$1000	7.81	30				
More than $ 1000	6.51	25				
Food expenses:			0.95	1.05	0	4
$1–$50	42.19	162				
$51–$100	33.33	128				
$101–$150	15.10	58				
$151–$200	6.25	24				
Over $200	3.13	12				
Purchase frequency:			1.47	0.82	0	4
Daily	5.99	23				
Weekly	54.95	211				
Biweekly	26.82	103				
Monthly	10.94	42				
Other	1.3	5				
Acquisition of food:			0.03	0.20	0	2
Buy physically	98.18	377				
Buy virtually	1.04	4				
Other	0.78	3				

Table 2. *Cont.*

Independent Variables	% of the Sample Population	Frequency	Average	S.D.	Min.	Max.
Most important factor when buying:			0.75	0.43	0	3
Brand of the product	16.84	65				
Price	48.65	187				
Health	32.83	126				
Other	1.68	6				
Knowledge TLNL:			0.97	0.17	0	1
Yes	96.88	372				
No	3.13	12				
I do not consume:			0.74	0.44	0	1
Yes	73.99	165				
No	26.01	58				
Diseases:			0.20	0.40	0	1
Has diseases	19.53	75				
Has no diseases/does not know	80.47	309				
Knowledge of processed food:			0.88	0.33	0	1
Yes	87.5	336				
No	12.5	48				
Use of labeling type:			1.84	0.99	0	3
None	3.39	13				
Nutritional traffic light	47.66	183				
Nutritional information	10.68	41				
Both of them	38.28	147				
Confidence in information from TLNL:			0.65	0.48	0	1
Yes	65.1	250				
No	34.9	134				
Influence of COVID-19:			0.71	0.45	0	1
Yes	71.09	273				
No	28.91	111				
Form of COVID-19 influence:			0.18	0.39	0	1
Positively influenced	82.05	224				
Negatively influenced	17.95	49				
Knowledge of RM:			0.86	0.35	0	1
Yes	85.94	330				
No	14.06	54				
Dependent variables						
Knowledge of RM:			0.71	0.45	0	1
Yes	71.35	274				
No	28.65	110				
TLNL understanding:			2.29	0.68	0	3
Does not understand	2.08	8				
Low level of understanding	6.77	26				
Medium level of understanding	51.04	196				
High level of understanding	40.1	154				
TLNL use:			0.58	0.49	0	1
Yes	58.07	223				
No	41.93	161				

Note: S.D.: standard deviation. TLNL: traffic light nutritional labelling. Source: Own elaboration from the survey database.

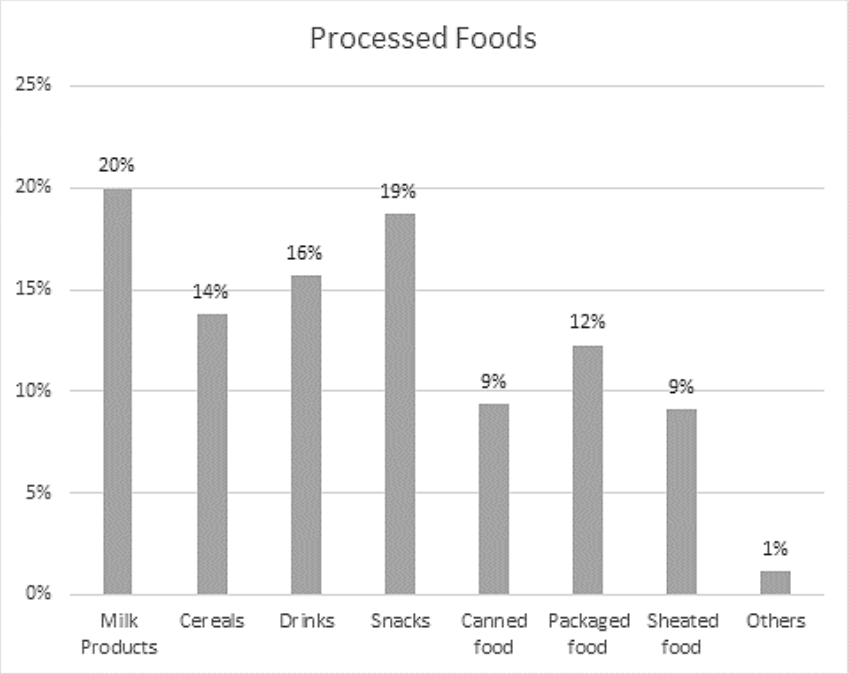

Figure 1. Products for which people use traffic light nutritional labelling (TLNL).

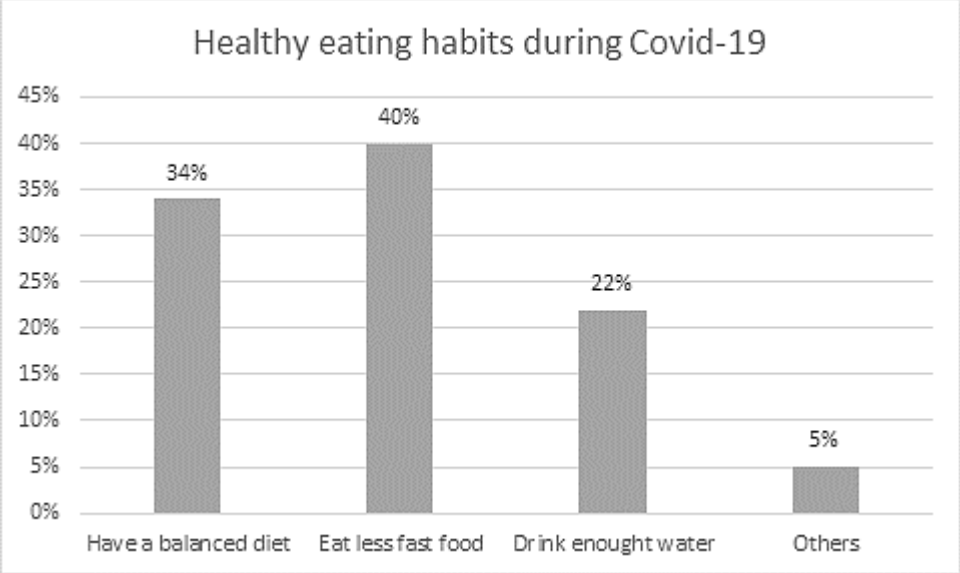

Figure 2. Percentage of participants who implemented healthy eating habits during the COVID-19 pandemic.

3.2. Models

Using cross-tabulation techniques and Pearson's chi-squared (χ^2) tests, the relationship between RM knowledge and sociodemographic variables, as well as the understanding and use of the TLNL, was analyzed. The variables that were significantly associated were age ($p < 0.05$), level of education, and understanding and use of the TLNL ($p < 0.05$) (Table 3).

Table 3. Associations between variables.

Knowledge of RM	Pearson Chi-Squared	Significance
Age	6.52 *	0.04 *
Sex	0.76	0.38
Marital status	0.97	0.92
Education level	20.42 *	0.00 *
Work	2.43	0.12
Income	3.26	0.66
Expenses	4.58	0.33
Understanding the TLNL	16.57 *	0.01 *
Using the TLNL	7.39 *	0.07

Note: A statistically significant association is indicated by *: $p < 0.05$. TLNL: traffic light nutritional labelling; RM: responsible marketing.

Table 4 shows the results of the ordinal logit model (OLM) and the binomial logit model (BLM). Results of the OLM show a positive relationship between knowledge of responsible marketing and the variables indicating education level and knowledge of the TLNL. In addition, this model shows that people with higher education were more likely to have a high level of understanding of the TLNL (OR = 1.68; $p < 0.05$). Likewise, those who had a high understanding of the TLNL were those that had knowledge of the TLNL (OR = 17.43; $p < 0.01$) and those who had knowledge of marketing (OR = 2.28; $p < 0.05$). The data on cut1, cut2, and cut3 in the OLM relate to threshold cutoff values that distinguish the categories of understanding of the TLNL, indicating the cumulative probabilities predicted when the independent variables are equivalent to zero.

Table 4. Results of the binomial and ordinal logistic regression models.

	OLM				BLM			
Dependent Variable	**Understanding of TLNL**				**Use of TLNL**			
Independent Variable	**Coefficients**	**Odds Ratio**	**95% CI for OR**		**Coefficients**	**Odds Ratio**	**95% CI for OR**	
			Lower	**Upper**			**Lower**	**Upper**
Education	0.5169 **	1.6768	1.0882	2.5839	−0.2997	0.7411	0.4506	1.2187
Income	−0.0025	0.9975	0.8673	1.1471	0.1603 ***	1.1739	0.9872	1.3958
Knowledge	2.8581 *	17.4281	4.7098	64.4904	1.6789 **	5.3599	0.9993	28.7485
Diseases	0.2747	1.3162	0.7977	2.1715	0.6330 **	1.8833	1.0154	3.4930
Confidence	0.2843	1.3288	0.8748	2.0183	1.7356 *	5.6723	3.5035	9.1835
COVID−19	−0.1128	0.8933	0.5778	1.3813	0.4444 ***	1.5595	0.9478	2.5658
Marketing	0.8226 **	2.2765	1.2081	4.2897	0.7331 **	2.0815	1.0391	4.1689
_const					−3.18177			
cut1	−0.4275		−1.6969	0.7829				
cut2	1.4419		0.1194	2.7128				
cut3	4.5080		3.0782	5.8095				
Log likelihood =	−346.89469				−222.3261			
Number of obs. =	384				384			
LR chi^2 (13) =	53.21				77.63			
Prob > chi^2 =	0				0			
Pseudo R^2 =	0.0712				0.1486			

Note: Significance levels: * $p < 0.01$; ** $p < 0.05$; *** $p < 0.10$. OLM: ordinal logit model; BLM: binomial logit model. TLNL: traffic-light nutritional labeling.

In the BLM, it was observed that the variable indicating participants' use of the TLNL showed a positive relationship with several independent variables (income level, knowledge of the TLNL, diseases, confidence in the TLNL, influence of COVID-19, and marketing knowledge). Additionally, the BLM showed that the probability of using the TLNL increased when people had a higher level of income (OR = 1.17; $p < 0.10$), when

they knew about the TLNL (OR = 5.35 $p < 0.05$), when people had any disease (OR = 1.88 $p < 0.05$), when they trusted the information presented by the TLNL (OR = 5.67; $p < 0.01$), when they stated that COVID-19 has influenced their food consumption habits (OR = 1.56; $p < 0.10$), and when they knew what marketing is (OR = 2.08; $p < 0.05$).

4. Discussion

In this research, the sample population was comprised of more women than men (63% vs. 38%), this is consistent with projections of the Ecuadorian population, where INEC estimates that the population is comprised of 51% women and 49% men [60]. At the national level, the unified minimum salary for 2021 was $400 [61]. However, the results show that most of the people surveyed (51%) had an income between $1 and $400, which does not cover the cost of the INEC July 2021 basic family needs ($711.68) or vital family needs ($501.25) [62]. Importantly, the results of this study showed that of the people who use the traffic light nutritional labelling (TLNL), 96% confirmed that this labeling helps them to better identify healthy foods from unhealthy ones. Similar results have been found in previous studies [63–69], indicating that the TLNL provides consumers with the ability to make a healthier purchase choice. Almost all of the respondents (97%) in this study knew of the TLNL (97%). However, the percentage of respondents that use the TLNL was much lower (58%); this relationship was also found in studies carried out at an international level [70,71]. An investigation carried out in district N°5 of the Metropolitan District of Quito in 2017 indicated that 45% of respondents almost always read the TLNL [72]. The percentage in the present study was higher, at 58% of the sampled population in Cuenca. In addition, respondents in this survey were asked to indicate which product types they used the labeling for most, with 20% saying they use it for dairy products, 19% for snacks, and 16% for soft drinks. These three product types also obtained the highest readership in the research carried out by Álvarez [72].

Sociodemographic variables are considered of utmost importance within the field of marketing since they help to determine market segmentation and, in turn, establish the strategies to use [73,74]. In the results obtained through the techniques of cross-tabulation and chi-squared (χ^2) tests, the relationship of knowledge of responsible marketing (RM) with sociodemographic aspects and TLNL was observed. The results were similar to other studies, indicating that RM should be seen as a strategic element for companies to carry out programs that provide and manage consumer behavior towards social welfare [3,75]. At the same time, in the review by Dueñas-Ocampo et al. [76], it was shown that some variables, such as level of education or socioeconomic level, may be related to responsible consumption. However, it does not always lead to responsible consumer behavior. Other research has shown that people with high levels of education have significant ratings on consumer behavior scales [76–79].

The results of the estimation of the ordinal logit model (OLM) constructed according to the perceptions of consumers revealed that education also plays a fundamental role in understanding the TLNL: a higher educational level was positively corelated with a high probability of understanding TLNL. This result is corroborated by other research that showed that with a higher educational level, people have a greater probability of understanding nutritional labels [49,80,81]. In addition, it was observed that the TLNL knowledge variable increased the probability of the consumer understanding of the TLNL. These findings are related to the results obtained in other studies in Ecuador and in some European countries, where it was highlighted that the TLNL is a front-labeling tool with a simple and easy-to-understand structure [36,38,82,83]. However, other research comparing TLNL and daily quantity guidelines with the "High in" warning system, showed that the latter was more effective in providing consumers with better precision to properly identify foods with high sugar, salt, and/or fat content, helping them to distinguish healthy foods more easily from those that are not [63,84–87]. The results obtained here also indicate that the likelihood of consumers understanding the TLNL increases when they understand the meaning of marketing. This aligns with the study by Rotfeld [88], where it was noted that

people with knowledge of marketing-related issues have a better understanding of what they read, pay greater attention to labels and use these to make their food choices, while those who do not have marketing knowledge continue to buy foods that are harmful to their health.

Regarding the results of the estimation of the binomial logit model (BLM) constructed according to the perceptions of consumers in response to the variable indicating use of the TLNL, level of education was not found to affect the decision to use nutritional labeling. Conversely, Drichoutis et al. [89] and Nayga et al. [90] reported that people who use nutrition labeling the most are those with a higher level of education. However, a positive relationship was found between income and the probability that consumers would use the TLNL. Similar results have been found in studies carried out by Krugmann [91] and Tolentino-Mayo et al. [81], who stated that individuals with a high income use nutritional labeling more. For their part, Grunert et al. [92] and FAO and PAHO [93] indicated that people with a lower income level consume foods high in saturated fats and sugars, due to their low price and easy access. In addition, other studies have indicated that healthier foods are priced higher than unhealthy ones, reducing their accessibility to those people with a low income [94–97]. Additionally, in the present study, it was found that people who suffer from a disease were more likely to use the TLNL. This coincides with investigations carried out in the United States of America, where, according to Lewis et al. [98], the consumers most likely to use nutritional labeling are those with chronic diseases. In turn, Elfassy et al. [99] indicated that individuals with hypertension are more likely to use nutritional labeling. Likewise, Post et al. [100] showed that 50% of people who use nutritional labels are those who need to lose weight and reduce calorie consumption. In the results of the current study, it was also demonstrated that a higher knowledge of and confidence in the TLNL increased the probability of its use, similar to the research carried out in Ecuador by Terán et al. [101], where a significant association between TLNL use and knowledge was revealed. Similarly, the study carried out in Europe by Feunekes et al. [38] showed that people have confidence in the TLNL. Interestingly, people who considered the COVID-19 pandemic to have influenced their consumption habits showed a greater probability of using the TLNL. This is comparable with the studies by Bennet et al. [102] and Di Renzo et al. [103], which highlighted that people had positive changes in eating habits due to the pandemic, improving eating behavior by increasing the intake of healthier food and decreasing their consumption of junk food. Furthermore, Zafar et al. [104] concluded that during the COVID-19 pandemic, consumers have chosen to consult nutritional labels more, choosing foods that contribute to their health.

However, other studies have recommended that entities planning to create and manage public policies on health and nutrition analyze the possibility of implementing octagonal warning labels, since according to several studies these are more effective than the TLNL. This is due to some misunderstandings around product nutrition that have been detected with TLNL, such as products with both the TLNL green image indicating "low in salt" (encouraging product purchase) and the red image indicating "high sugar or fat content" (encouraging product rejection), which may lead to the consumption of non-nutritive products [63,105–111]. Furthermore, TLNL is unlikely to be used by individuals with vision problems such as color blindness, as they are unable to distinguish between red and green [32].

Finally, the present study showed that people who have some knowledge of what marketing is had a greater probability of using the TLNL. This is linked to what was mentioned by Soederberg and Cassady [112]: consumers with any prior knowledge of marketing-related issues use nutritional labels more efficiently, as this allows them to better understand labeling information, providing adequate decision-making power in the purchase of healthy products.

5. Conclusions

In this research, responsible marketing (RM) in the traffic light nutritional labelling (TLNL) of food products was analyzed based on the perception of consumers in Cuenca, Ecuador. It was found that the variables significantly associated with the knowledge that consumers have of RM were age, level of education, and understanding and use of the TLNL. In addition, it was found that people, and especially those with a higher education level, are more likely to have a high level of understanding of TLNL; likewise, those who had knowledge of TLNL and marketing had a higher understanding of TLNL. On the other hand, the probability of using the TLNL increased when consumers had a higher level of income, when they knew about TLNL, if they had any disease, if they had confidence in TLNL, when they perceived that COVID-19 had influenced their habits of food consumption, and when they had some marketing knowledge. Based on these results, this study concluded that the TLNL is a good RM practice. However, the RM must be strengthened, because the mandatory regulation imposed by Ecuador, where all processed and ultra-processed products must have the TLNL on their packaging, which indicates the high (red), medium (yellow), or low (reference) content of sugar, fat, or salt of said product, is not enough (green) More effort should be made by the state and food companies to disseminate clear and understandable information regarding the labeling and advertising of food. Likewise, campaigns should be carried out to educate the population about responsible consumption in order to improve their food and nutritional security and reduce the incidence of non-communicable diseases (NCDs), such as obesity. Such health issues place individuals at a higher risk of contracting and dying from COVID-19 [113–116]. Therefore, the necessary political will should be generated to support such measures, although this may generate strong resistance from companies engaged in manufacturing or distributing processed or ultra-processed food products, and their marketing.

There are limitations to this study. Given that it was oriented only towards the urban area and not towards the rural area, it is not possible to provide a conclusion at the Cuenca general population level. It was also not possible to observe whether people were actually using the TLNL when buying their food. Despite these limitations, the findings obtained in this study can serve as a baseline for future research, providing a greater understanding of RM and front-end food labeling, especially TLNL. In addition, the results of this research can serve as support for decision making in companies and governments concerning RM strategies that do not favor the sale of products that are harmful to people's health.

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