Use of nutritional labels and claims during COVID-19: the moderating effect of risk perception

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Acknowledgements:
This project has received funding from the European Union's H2020 research and innovation program under Marie Sklodowska-Curie grant agreement No 801586, and form Ministry Science, Innovation and Universities and European Regional Development Fund (ERDF)

Cite as:
Bou Fakhreddine Lara, Garcia Marian, Sanchez Mercedes (2022), Use of nutritional labels and claims during COVID-19: the moderating effect of risk perception. *Proceedings of the European Marketing Academy*, 51st, (107091)

Paper from the 51st Annual EMAC Conference, Budapest, May 24-27, 2022

Use of nutritional labels and claims during Covid-19: the moderating effect of risk perception

Numerous studies investigate consumer behavior towards the use of nutritional labels and claims. However, the understanding as to whether COVID-19 risk perception impacts this said relationship is missing. Contributing to this gap, this study examines consumers' personal (e.g., health consciousness and understanding nutritional labels) and product attributes factors (e.g., price and packaging) by analyzing how COVID-19 risk perception moderates such factors towards healthy behavior. The analyses are conducted using 2,837 responses gathered through an online survey in Spain and the UK during 2021. There is a difference in the use of nutritional labels and claims in both countries. The consumer's health consciousness is positively related to healthy behavior. Besides, COVID-19 risk perception enhances healthy behavior by reducing the importance of product price and packaging. These results are important for food marketers to develop marketing campaigns using nutritional labels and claims.

Keywords: COVID-19 risk perception, Nutritional labels, Claims

Track: Consumer Behavior

1. Introduction

Noncommunicable diseases (NCDs) are responsible for 71% of all deaths globally, equivalent to 41 million people killed each year (World Health Organization,2021). However, unhealthy diets amongst other factors increase the risk of dying from these diseases (World health organization,2021). Public organizations are encouraging consumers to adopt a healthier lifestyle by several communication strategies such as nutritional labels and claims (Provencher & Jacob, 2016). Furthermore, nutrition labels and claims are an important means to facilitate the choice of healthy food (Talati et al., 2017). Additionally, they are considered as an essential marketing tool for supporting consumers to make healthier food choices while purchasing products (Baltas, 2001). Furthermore, the use of these labels and claims is recognized as a preventive healthy behavior (Drichoutis et al., 2006) that has been defined as "any activity undertaken by an individual who believes himself to be healthy for preventing or detecting illness in an asymptomatic state" (Kasl & Cobb, 1966). However, this behavior can easily be affected by major disturbances in daily life (Prochaska & Velicer, 1997). COVID-19 pandemic is one of the most disruptive events experienced by human beings recently.

Dryhurst et al., (2020) found that COVID-19 risk perception is correlated with the adoption of preventive health behaviors, which ultimately can prevent people from getting the virus. For example, Bracale and Vaccaro (2020) found out that consumers may reduce the risk of catching the virus by buying more packaged food, or using nutritional labels and claims leading to healthier food choices and boosted immune systems (Nicomedes & Avila, 2020). Since the emergence of COVID-19, the researchers amongst other things have started to study the effect of such pandemic on consumer's food behavior, consumption (Gordon, 2021), food safety, and security (Djekic et al., 2021). However, to our knowledge, there is no study that investigates the effect of COVID-19 risk perception on the use of nutritional labels and claims. Studying this effect is important to determine any changes caused by this pandemic on this preventive healthy behavior, and that more accurate effect of this pandemic can be forecast, thus food marketers could anticipate future health crises and improve food labels for the welfare of the public health in general and each individual in specific.

1.2. *Background and hypothesis:*

Recently, researchers have become more interested in investigating the different aspects that could affect healthy behavior, which also consists of the use of nutritional labels and claims (Bazzani, Capitello, Ricci, Scarpa ,and Begalli, 2020; Zhang, Zhai, Osewe, and Liu, 2020).

This behavior is however dynamic and influenced by several factors (Bernabéu & Díaz, 2016). For instance, a consumer's health consciousness is one of the factors that stimulates use of nutritional labels and claims (Cavaliere & Bartali, 2016). Similarly, the understanding of such labels and claims also drives consumers towards using them (Lombardi et al., 2021). Whereas, some authors focus on the influence of the product attributes (e.g., price, packaging, etc.) on the use of nutritional labels and claims (Jo & Lusk, 2018; Tijssen, Zandstra, Graaf, and Jager, 2017). And in this vein, it was found that product price negatively impacts the use of nutritional labels and claims (Jo & Lusk, 2018). While the product packaging, a clear design in terms of shape, colors, and picking the correct nutritional labels could help consumers to predict the healthiness of the product (Plasek, Lakner, and Temesi, 2020).

While the above is true during normal times, pandemics can lead to major food safety problems, and factors like consumer´s risk perception are likely to dominates when consumers are purchasing food products (Barrena & Sanchez, 2010). And amongst the available tools for consumers to evaluate the quality of the product, are the packaging (Das, Jain, Maheswaran, Slotegraaf, and Srinivasan, 2021) and nutritional labels and claims (Karakaya & Saracli, 2018). Hence, to substantiate and investigate regarding the risk perception as being an important factor of healthy preventive behavior that leads to the use of nutritional labels and claims (Karakaya & Saracli, 2018), we test the following hypotheses:

H1a. Health consciousness is positively related to the use of nutritional labels

H1b. Health consciousness is positively related to the use of claims

H2a. Understanding nutritional labels are positively related to their use

*H2b.*Understanding claims are positively related to their use

H3a. The price is negatively related to the use of nutritional labels

H3b. The price is negatively related to the use of claims

H4a. The packaging is positively related to the use of nutritional labels

H4b. The packaging is positively related to the use of claims

H5a. COVID-19 risk perception moderates negatively the relationship between price and use of nutritional labels

H5b. COVID-19 risk perception moderates negatively the relationship between price and use of claims

H6a. COVID-19 risk perception moderates negatively the relationship between the importance of packaging and use of nutritional labels

H6b. COVID-19 risk perception moderates negatively the relationship between the importance of packaging and use of claims

2. Research method

The data was gathered through an online survey in two countries: Spain and United Kingdom. Besides, the Spanish survey was performed through a Spanish company called "Intercampo", over an online access panel. A sample of 1500 individuals was gathered between the 26th of February and the 8th of March 2021. Whereas, for the United Kingdom sample, an online survey in Qualtrics was designed and obtained completed responses from around 1288 individuals in panels maintained by "Prolific Academic" in the United Kingdom. Our final sample consisted of 2,837 valid cases in total: 1,533 from Spain and 1,304 from the UK. The questionnaire dwelled into four sections, in which the first section embodied questions related to the understand and the use of the nutritional labels and claims during the COVID-19 pandemic. Whilst the second section consisted of questions related to COVID-19 risk perception (Dryhurst et al., 2020). Moreover, the third section is related to health and COVID-19 that contained health consciousness questions (Gould, 1988). And finally, the fourth section involved socio-demographic and lifestyle questions. A logistic regression through Stata ver. 16 software (Stata Corp LLC, Texas, USA) was performed to test our hypotheses. Our dependent variable consisted of the use of nutritional labels and claims, it is measured following (Zhang et al., 2020) as a binary variable and where consumers using nutritional labels and claims are classified as 1, and those who not as 0. Our independent variables consisted of health consciousness, understanding nutritional labels and claims, and the importance of two product attributes (price and packaging). For instance, regarding health consciousness, the consumers were asked to indicate in a five-point Likert scale how much does each statement of Gould (1988) scale describes them (ranging from 1 = "not at all describes you" to 5 = "describes you very well"). The understanding of nutritional labels and claims were measured as a continuous variable on a five-point Likert scale with five indicating the highest level of agreement (Hung & Verbeke, 2019). Finally, the two product attributes price and packaging were estimated as continuous variables by a five-point Likert scale with five indicating the highest level of importance given to these attributes while purchasing a product (Banterle & Cavaliere, 2014). The COVID-19 risk perception is considered as a moderation variable and measured following

Dryhurst et al., (2020) scale containing several items measured by a four- or five-point Likert scale. The controlled variables considered were age, income education, going less to store, and shopping online (Zhang et al., 2020) Additionally, Hosmer & Lemeshow test showed that the data fit well in all the models tested (χ^2 has a low value between 2.27 and 14.75; $P>0.1$). Nonetheless, in our study, the variance was 13.01% and 12.9% for Spain and UK data respectively. Therefore, the amount of common-method-variance was not significant in our research. Since the two variables health consciousness and COVID-19 risk perception are measured by a scale of different items, a Principal Component Analysis (PCA) was executed to load the items of each scale.

3. Results

A McNemar test compared the percentages of consumers who have used the nutritional labels and claims before and after the COVID-19 in each country. The results showed that there is a significant difference in the use of all the nutritional labels and claims in Spain before and after COVID-19. While in the UK there is only a significant difference in the use of claims before and after COVID-19.

Tables 1 and 2 show that consumers with high health consciousness have a higher probability to use nutritional labels and claims even during the COVID-19 pandemic. Hence, hypotheses H1a and H1b are supported. However, regarding the understanding of nutritional labels, the results for Spain demonstrate that the consumers who understand the nutrition fact panels, the traffic light, the nutritional claims, and health claims hold a higher probability to use these labels and claims. Whereas, understanding the guideline daily amount is not associated with its use ($\beta=0.03$, $p > 0.1$) as shown in Table 1. On the other hand, the results for the UK indicate that the consumers who understand the nutrition fact panels, the traffic light, and the guideline daily amount have a higher probability to use them, but the understanding of claims is not related to their use as revealed in Table 2. Therefore, H2a and H2b are partially supported and depend on the type of nutritional labels and claims.

Nevertheless, Spanish consumers who give high importance to the product price have a lower probability to use the traffic light, the guideline daily amount, and the health claims. However, there is no association between the use of nutrition fact panels and nutrition claims. In contrast, in the UK, the higher importance given to the product price does not affect the use of all the nutritional labels (nutrition fact panels, traffic light and guideline daily amount) and the claims (nutrition and health claims), as shown by Table 1 and 2. Therefore, H3a and H3b

are partially accepted. Nonetheless, Spanish consumers who give high importance to the product packaging have a high probability to use all the types of nutritional labels and the claims studied as demonstrated by Tables 1 and 2. However, UK consumers who prioritize the product packaging have a high probability to use only the health claims, whilst for the other type of nutritional labels and nutritional claims, there is no relationship. Hence, H4a and H4b are partially supported.

Furthermore, the COVID-19 risk perception moderates negatively the relationship between the traffic light, the guideline daily amount in Spain, and the product price, also the relationship between the use of the nutrition facts panel and the price in the UK. For instance, with a higher level of COVID-19 risk perception, the use of the traffic light and guideline daily amount is higher when the importance given to the price increase. Whereas the COVID-19 risk perception moderates negatively the relationship between the nutrition facts panel, guideline daily amount, and nutrition claims in Spain and the product packaging. In other words, with a higher level of COVID-19 risk perception, the use of these labels and nutrition claims is higher when the importance given to the packaging increase. But there is no moderation for the relationship between the product packaging and the use of nutritional labels and claims in the UK. On the other hand, regarding the UK, a low to no moderation effect of COVID-19 risk perception exists on the relationship between the use of nutrition fact panel and guideline daily amount and the importance of the price. However, with higher COVID-19 risk perception the use of traffic light is higher when the importance given to price increase. Therefore, the following hypotheses H5a, H5b, H6a, H6b are dependent on the type of nutritional labels and claims.

Regarding our control variables, age is related negatively to the use of nutritional labels and claims, opposite to the literature that showed that elderly people are more interested in these labels (Zhang et al., 2020). The other control variables as education, income, going less to a store, or buying online is dependent on the type of nutritional labels or claims considered.

	Nutrition fact panel		Traffic light		Guideline daily amount	
	Spain	UK	Spain	UK	Spain	UK
Direct effects						
Health consciousness	0.54***	0.68***	0.57***	0.33***	0.61***	0.39***
	(.089)	(0.07)	(0.07)	(0.07)	(0.08)	(0.06)
COVID-19 risk perception	0.39	0.27	0.84**	0.29	1.07***	0.02
	(0.42)	(0.44)	(0.35)	(0.44)	(0.38)	(0.40)
Understanding nutritional labels	0.16**	0.28***	0.20***	0.18***	0.03	0.26***
	(0.07)	(0.07)	(0.06)	(0.07)	(0.06)	(0.06)
*Product attribute*s						
Price	-0.15	0.03	-0.19**	0.11	-0.18**	-0.00
	(0.09)	(0.08)	(0.08)	(0.08)	(0.08)	(0.07)
Packaging	0.13*	0.09	0.17***	0.07	0.23***	-0.01
	(0.07)	(0.06)	(0.06)	(0.06)	(0.07)	(0.06)
Control variables						
Young people	0.39**	-0.47***	0.50***	0.19	0.20	0.07
	(0.20)	(0.16)	(0.16)	(0.17)	(0.18)	(0.15)
Elderly people	-0.46**	-0.03	‘0.34*	-0.32	-0.41**	-0.76***
	(0.22)	(0.24)	(0.20)	(0.22)	(0.20)	(0.21)
Gender (base: female)	0.14	0.12	0.13	-0.00	0.28**	-0.10
	(0.16)	(0.14)	(0.13)	(0.14)	(0.14)	(0.13)
Medium income	-0.26	-0.03	0.16	0.04	-0.12	0.15
	(0.24)	(0.18)	(0.19)	(0.18)	(0.21)	(0.16)
High income	-0.51	0.43	-0.34	0.18	-0.59*	0.24
	(0.37)	(0.28)	(0.31)	(0.27)	(0.33)	(0.24)
Education						
University or higher degree	-0.22	0.13	-0.19	0.02	0.82	-0.04
	(0.84)	(0.15)	(0.73)	(0.15)	(0.71)	(0.14)
Going less to store	-0.07	0.15	-0.15	0.26	-0.07	0.28*
	(0.17)	(0.18)	(0.14)	(0.18)	(0.15)	(0.16)
Doing online grocery shopping	0.29	0.17	0.58 ***	0.13	0.23	0.21
	(0.19)	(0.14)	(0.15)	(0.15)	(0.17)	(0.13)
Interaction effects						
Health consciousness COVID-19 risk perception*	-0.01	-0.09	0.10	-0.03	0.03	-0.02
	(0.08)	(0.07)	(0.07)	(0.06)	(0.07)	(0.06)
Understanding nutritional labels * COVID-19 risk perception	0.03	0.10	0.00	0.04	0.03	0.13**
	(0.07)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
Price * COVID-19 risk perception	0.01	-0.13*	-0.13*	-0.11	-0.13*	-0.11
	(0.08)	(0.08)	(0.07)	(0.07)	(0.07)	(0.07)
Packaging * COVID-19 risk perception	-0.17**	-0.00	-0.09	0.03	-0.19***	0.02
	(0.08)	(0.06)	(0.06)	(0.06)	(0.07)	(0.06)
Constant	2.28*	-1.25**	0.96 *	-0.11	1.70***	-0.18
	(0.62)	(0.60)	(0.51)	(0.60)	(0.56)	(0.54)
(Nagelkerke R^2)	0.115	0.166	0.180	0.069	0.143	0.106

Notes: Standard deviation in parentheses. ***, **, and * indicate statistical significance at the levels of 1%, 5%, and 10%, respectively.

Table 1. Determinants of the use of nutritional labels

	Nutritional claims		Health claims	
	Spain	UK	Spain	UK
Direct effects				
Health consciousness	0.42***	0.29***	0.46***	0.53***
	(0.08)	(0.06)	(0.07)	(0.08)
COVID-19 risk perception	0.58	0.09	0.24	-0.58
	(0.38)	(0.39)	(0.35)	(0.44)
Understanding nutritional labels	0.17**	0.04	0.21***	-0.02
	(0.06)	(0.06)	(0.06)	(0.07)
Product attributes				
Price	-0.12	0.05	-0.19**	-0.09
	(0.08)	(0.07)	(0.08)	(0.08)
Packaging	0.18***	0.04	0.19***	0.12*
	(0.07)	(0.05)	(0.06)	(0.06)
Control variables				
Young people	-0.07	0.31**	0.14	0.16
	(0.17)	(0.13)	(0.16)	(0.15)
Elderly people	0.06	0.13	-0.08	-0.96***
	(0.22)	(0.20)	(0.20)	(0.29)
Gender(base:female)	0.22	0.22*	0.12	0.06
	(0.14)	(0.12)	(0.13)	(0.14)
Medium income	-0.42*	-0.01	-0.14	-0.38**
	(0.23)	(0.15)	(0.20)	(0.17)
High income	-0.15	-0.08	-0.28	-0.47*
	(0.37)	(0.23)	(0.33)	(0.26)
Education				
University or higher degree	1.50		0.64	-0.11
	(0.73)		(0.71)	(0.15)
Going less to store	0.08	0.10	0.14	0.06
	(0.15)	(0.16)	(0.14)	(0.19)
Doing online grocery shopping	0.73***	0.17	0.48***	0.35**
	(0.18)	0.12	(0.16)	(0.14)
Interaction effects				
Health consciousness* COVID-19 risk perception	0.10	0.03	0.07	0.07
	(0.07)	(0.05)	(0.07)	(0.07)
Understanding nutritional labels * COVID-19 risk perception	0.02	0.03	0.07	0.06
	(0.06)	(0.05)	(0.06)	(0.07)
Price * COVID-19 risk perception	-0.01	0.01	-0.07	0.11
	(0.07)	(0.06)	(0.07)	(0.07)
Packaging * COVID-19 risk perception	-0.14*	-0.02	-0.04	-0.05
	(0.07)	(0.05)	(0.06)	(0.06)
Constant	0.43	-0.58	0.59	-0.25
	(0.55)	(0.52)	(0.52)	(0.58)
(Nagelkerke R^2)	0.143	0.042	0.138	0.105

Notes: Standard deviation in parentheses. ***, **, and * indicate statistical significance at the levels of 1%, 5%, and 10%, respectively.

Table 2. Determinants of the use of claims

4. Implications

Our findings have implications for the existing literature, food marketers, and policymakers. For the existing literature, further findings by comparing a wide range of nutritional labels and claims were added. Hence, we confirmed that consumers react differently to each type of these labels and claims. Moreover, we emphasized that consumer's risk perception triggers a notable change in consumer behavior, especially the use of these labels that was scarcely studied in the literature. Additionally, a novel insight was reached that the healthy feature of the product as food labels is favored during a health crisis more than other extrinsic product attributes like price and packaging. For the food marketers, our findings motivate them to focus on improving the food labels, for the welfare of the public health in general and each individual in specific since this pandemic leads to changes in their use. Moreover, to make a balanced marketing strategy that embodies the different tools as price, packaging, and food labels to catch the attention of the consumers. Furthermore, additional insights were given to the food marketers regarding the factors influencing the consumer behavior towards food labels, that could help them to improve these labels consistently with consumer's needs and preferences. For the policymakers, our findings suggest implementing different policies that align with the culture of each country. The cultural differences may affect consumer' s preferences towards the food labels since each consumer has a specific background. Additionally, implementing nutritional education campaigns to enhance the consumer's understanding of these labels.

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