

## Article

# Consumers' Knowledge and Use of Nutritional Labelling Information in Lagos, Nigeria

Evaristus Adesina <sup>1,\*</sup> , Boluwatife Ajayi <sup>1</sup>, Emmanuel O. Amoo <sup>2</sup> , Babatunde Adeyeye <sup>1</sup>, Mofoluwake P. Ajayi <sup>3</sup>, Tomike Olawande <sup>3</sup>, Adebanye Olawole-Isaac <sup>2</sup> and Mercy E. Udume <sup>3</sup>

<sup>1</sup> Department of Mass Communication, College of Management and Social Sciences, Covenant University, Ota 112233, Nigeria; boluwatifeajayi6@gmail.com (B.A.); babatundeadeyeye@covenantuniversity.edu.ng (B.A.)

<sup>2</sup> Department of Demography and Social Statistics, College of Management and Social Sciences, Covenant University, Ota 112233, Nigeria; emma.amoo@covenantuniversity.edu.ng (E.O.A.); adebanke.olawoleisaac@covenantuniversity.edu.ng (A.O.-I.)

<sup>3</sup> Department of Sociology, College of Management and Social Sciences, Covenant University, Ota 112233, Nigeria; mofoluwake.ajayi@covenantuniversity.edu.ng (M.P.A.); omike.olawande@covenantuniversity.edu.ng (T.O.); mercy.adebayo@covenantuniversity.edu.ng (M.E.U.)

\* Correspondence: evaristus.adesina@covenantuniversity.edu.ng

**Abstract:** Nutrition labelling is a topical issue, being a vital aid that shapes consumers' food choices and could be an efficient tool for the prevention of consumer vulnerability to diet-related diseases such as cancer, high blood pressure, hypertension, and obesity. However, data on the public use of nutritional labels as an information source on nutritional properties of foods and health claims, especially as it relates to Nigeria, are not popular in the literature. This study seeks to examine consumers' use of labelling information: knowledge; attitude, and practice. A cross-sectional study with the aid of a survey elicited information from 374 randomly selected shoppers in five shopping malls in Lagos State. Data were analysed using the T-test method. Findings show that while the majority of the respondents (70.6%) read the nutritional information, only 64.9% understand the information presented on food labels. The study also reveals that the majority of the respondents (57.5%) do not know that information on food labels should be presented in the English language before any other language as recommended by the National Agency Food and Drug Administration and Control (NAFDAC). While 57.9% of consumers have a positive attitude towards using food labels, 58% of the respondents' buying decisions are influenced by food labels. The study concludes that consequent upon the importance of nutritional knowledge and wellbeing, consumers of Fast Moving Goods in Nigeria are beginning to consciously pay attention to nutritional labels. The study recommends that producers of Fast Moving Consumer Goods (FMCG) products in Nigeria should adopt the total disclosure of ingredients and nutritional content of their products. Also, regulatory bodies in charge of pre-packaged food products in Nigeria (NAFDAC) should go the whole way and make nutritional labelling mandatory.

**Keywords:** nutritional labels; consumer; knowledge; attitude; practice



**Citation:** Adesina, E.; Ajayi, B.; Amoo, E.O.; Adeyeye, B.; Ajayi, M.P.; Olawande, T.; Olawole-Isaac, A.; Udume, M.E. Consumers' Knowledge and Use of Nutritional Labelling Information in Lagos, Nigeria. *Sustainability* **2022**, *14*, 578. <https://doi.org/10.3390/su14010578>

Academic Editor: Giuseppe Antonio Di Vita

Received: 27 October 2021

Accepted: 21 December 2021

Published: 5 January 2022

**Publisher's Note:** MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



**Copyright:** © 2022 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

## 1. Introduction

Over the years, Fast Moving Consumer Goods (FMCG) companies have used various methods to inform, educate, and influence the purchasing power of their current and prospective customers, including advertisements, public relations, and digital marketing [1]. The unique platform of nutritional labels, on the other hand, has been used by Fast Moving Consumer Goods (FMCG) to communicate the substance of their products to their customers. Nutritional labelling is one of the ways pre-packaged food companies interact with their customers.

Through packaging, nutritional labelling explains a product's composition of nutrients, such as protein, fat, carbs, food additives, and preservatives, among others. The globally

accepted definition of a food label, according to Agarwal [2], is any tag, mark, pictorial, or other descriptive text, written or printed, attached to a pre-packaged food container. As a result, nutrition labels are critical tools for informing consumers about the nutritional properties of the food and its health claims [2,3]. The nutritional labelling of food products has received much attention in the previous decade, primarily because of its predicted contributions to customers' informed decisions regarding satisfying dietary standards [4]. The nutritional value of food, which is presented to consumers via the nutrition label, is an important aspect that can affect consumer decisions. However, lack of time, insufficient information, and attitude towards labelling information with attendant unhealthy eating have all been connected to diet-related disorders, with significant risk factors for chronic diseases such as cancer, diabetes, and obesity-related conditions [5].

While food labels can present aspiring customers with a wealth of potentially useful information, consumers must be aware of the information and pay attention to the message [4]. Customers must also comprehend the messages in order for the information to be helpful. Even with mandatory labelling, Jáuregui et al. [6] have noted that the benefits are only realized when the consumer comprehends and applies the nutritional information. The product must not only be labelled, but it must also respect the buyer's decision-making process [7]. Consumers differ, and as a result, the value placed on labels will differ as well.

Labels are related to various concerns, but just one is critical to this study. Is nutritional labelling information of interest to consumers? Demographics, health concerns, eating habits, and timing all influence consumer interest [8,9]. This study focuses on customer interest because nutritional labels have little economic or societal significance if consumers are not interested in them [10].

Beyond offering immediate assistance in making a purchasing decision, labelling may have economic value. Nutritional labelling has a traceability component that may appear unimportant to consumers at first. However, in food scarcity or an event that results in legal concerns relating to product sources and composition, the labelling content may be required to litigate and trace products back to the manufacturer [6]. The significance of nutrition labelling is realized when the topic of nutrition emerges rather than when a purchase decision is made right away.

Obesity and diet-related disorders have become more prevalent over time [4,5,11]. The World Health Organization (WHO) estimates that 79 percent of persons aged 18 and up worldwide (40 percent of females and 39 percent of males) suffer from diet-related disorders [12]. Obesity is expected to climb to 50% in Africa by 2030 [13,14]. Nigeria's population is also suffering from an upsurge in diet-related ailments. Obesity rates in Nigeria have risen from 12.5 percent to 20.3 percent, accordingly [15].

As a result of the rise in diet-related diseases, several governments have emphasised the necessity of food labelling in reducing diet-related concerns and assisting consumers in making better food purchasing decisions [4]. Food labelling allows consumers to make informed decisions [9]. The Nutritional Labelling and Educational Act (NLEA) was introduced by the US Food and Drug Administration (FDA) in 1990, and the NLEA regulations on nutrition labelling were implemented in 1994 [6]. Sections 5 and 30 of the National Agency for Food and Drug Administration and Control Act Cap NI Laws of Federation of Nigeria (LFN) 2004 empower the National Agency for Food and Drug Administration and Control (NAFDAC) to raise food production standards as well as laws against food commodities that are harmful to human health [16]. The Act specifies that no one may manufacture, import, distribute, advertise, display for sale, sell, or use pre-packaged foods unless they are labelled under these standards [17].

According to NAFDAC [17], a food label must contain characteristics of food product name, net contents, manufacturer's name and address and a nutritional facts label. The food product name must feature the brand and common name of the product and may also include a picture. Net contents should consist of information that represents the entire weight, including liquid. The amount listed is in common household amounts (pounds/ounces) and metric measures (grams/millilitres). NAFDAC [17] further explains

that the manufacturer's name and address must be included in the nutritional label to allow consumers to make enquiries about the product. Lastly, manufacturers are to make available nutrition facts required to provide information on certain nutrients. The mandatory nutrients are total calories, calories from fat, total fat, saturated fat, trans fat, cholesterol, sodium, total carbohydrates, dietary fibre, sugars, protein, vitamin A, vitamin C, calcium and iron. If a claim is made about any other ingredient or nutrient, the manufacturer is required to include that information.

Despite the availability of product ingredient labelling rules, it has been shown that customers make purchases without considering the available information [6]. When customers attempt to read the food label, they run into an intellectual roadblock because they do not grasp what is said [4].

Scholars have further noted that consumers do not use all of the information on food labels [6,8,9]. According to a survey done by Oghojafor et al. [5], consumers pay greater attention to substances they want to avoid than helpful information on food labels. Empirical studies have also revealed that most consumers do not understand nutritional labels and cannot calculate their dietary requirements [6,11,18]. On the other hand, some consumers believe that the mere presence of a food label demonstrates the manufacturer's effort to make the product healthful [4]. While many studies on food labels have been conducted in developed countries such as the United States [6], Ireland [19], and the United Kingdom [20], few studies have been conducted in third-world countries such as Nigeria, particularly among the urban population who buy FMCG products [4,16]. Nigerians' use of information sources, knowledge, and practice concerning food labelling content demonstrates this discrepancy. As a result, the purpose of this study is to look into how consumers in Lagos State use information sources, knowledge, attitude and practice when it comes to nutritional labelling.

This study is significant to the extent of contributing to SDG 3 (Good Health and Well-being), which aims to improve people's well-being by providing empirical data that support the use of food labels in curbing diet-related diseases. Specifically, this study shall provide data on consumer use of information sources, knowledge, and practice towards nutritional labels in Lagos State, thereby engendering the attainment of the SDG 3. This study shall also aid policy enunciation and implementation of agencies that are concerned with food safety in Nigeria, such as the National Agency for Food Drugs Administration and Control (NAFDAC), Standards Organisation of Nigeria (SON), National Codex Committee (NCC).

## 2. Materials and Methods

### 2.1. Research Design

This study adopted the quantitative survey method to examine consumers' knowledge of food labelling and their use of information sources with respect to food labelling. The study also assessed consumers' attitudes towards food labelling and their practices. The justification for the survey method is predicated on its strength of eliciting the views of the large target population of FMCG's consumers in Lagos [21].

The population consists of consumers in the central business district (CBD) of Lagos metropolis, specifically, Victoria Island in Eti-Osa Constituency. The district also doubled as a tourist centre with endowed beaches, harbours a major seaport, and serves as headquarter for head offices of major companies and parastatals. In addition, the CBD has 12 shopping malls that sell FMCG's products [22].

### 2.2. Sample Size and Sampling Technique

The study location has a population of 390,800. The sample size determination followed the Taro Yamane technique that signified the use of 384 sample size as scientific enough for a quantitative study and generalisation of the findings from such data [23].

However, a buffer of 4% was introduced for possible uncompleted interview. Overall, 400 consumers were selected for the interview.

$$\begin{aligned}
 &= \frac{N \left( Z \frac{(d-c)}{2(e)} \right)^2}{N - 1 + \left( Z \frac{(d-c)}{2(e)} \right)^2} \\
 n &= \frac{390,800(384)^2}{390,800 - 1 + (384)^2} \\
 n &= \frac{150,067,200}{390,800 - 385} \\
 n &= \frac{150,067,200}{390,415} = 384
 \end{aligned}$$

where, N (Total Population) = 390,800.

n (Sample Size) = 384.

In the selection of consumers, the study employed a multistage sampling technique but first randomly selected five shopping malls out of the identified 12 malls in the business district. The selected shopping malls are Multiker, The Palms shopping mall, Grand-Square, Food Corner, and Deja-Vu. Eligible prospective respondents are those customers that purchased FMCG's products from the shopping malls. Thus, we adopted a purposive sampling technique in selecting shoppers of the five shopping malls selected who actually purchased FMCG's products from the selected shopping malls. Our trained enumerators who have been permitted to stay in the shopping malls and strategically positioned closer to FGMC products' shelves monitored the customers and approached them if they would be willing to participate in the survey. The approach was adequate considering that the prospective respondents (customers) are on the go.

Due consent was therefore obtained, and volunteers consumer were surveyed using the structured questionnaire for the study. The questionnaire was divided between the five shopping malls.

The questionnaire developed by the researchers was made up of five sections; A, B, C, D, E. Section A contained the demographic characteristics of the respondents. Section B included consumers' use of information sources of food labelling. Section C consisted of the consumer's knowledge of food labelling. Section D was used to determine consumers' attitudes towards food labelling. Section E was used to investigate consumers' practices towards food labelling. The question was in the form of a Likert scale. The Confirmatory Factor Analysis (CFA) was used to determine the validity, error variance, composite reliability and average variance extracted estimate of the research instrument. The validity and reliability of the research route were established by using the pre-test reliability method and the Cronbach's alpha. The Guttman split-half coefficient resulted in 371. The Guttman split-half was used because it helps to measure the equivalence and internal consistency of the instrument [24,25]. The study trajectory was, therefore, considered satisfactory for the study. Likewise, the questionnaire was pretested via a pilot study on a sample of 50 respondents to ascertain the reliability of the instrument.

### 2.3. Data Analysis Procedures

Two levels of analyses were conducted, namely: univariate and bivariate analyses. The univariate was used to present the distribution of respondents by selected demographic characteristics while the bivariate was used to assess simultaneous association between variables of interest with respect to the objectives of the study. Specifically, the test of relationship was performed using T-test statistical techniques with the aid of Statistical Package for Social Sciences (SPSS) version 20. It was used to aid the researchers in evaluating data derived from the copies of the questionnaires that the respondents filled.

#### 2.4. The Reliability of the Instrument

Composite reliability and Cronbach's alpha were both used to determine the reliability of the instrument. The composite reliability and Cronbach's alpha of all the specific constructs as shown in Table 1 were above the recommended threshold of 0.80 and 0.70, respectively. This implies that there is internal consistency in the scale of items. Meanwhile, the factor loading of all the specific items of each variable are above 0.70. Reliability is deemed necessary to test the goodness of the measure used in research. It is equally not sufficient; thus, validity becomes imperative to certify the measure of the goodness of a measure. Therefore, a convergent validity test was carried out to determine if the indicators in a scale load together on a single construct. The average variance extracted estimate (AVE) was applied in testing the validity of the instrument. The AVE coefficients for information sources, knowledge, attitude, and practice are 0.590, 0.649, 0.648, and 0.678, respectively. These values are greater than the recommended 0.50 threshold and also exceeded the cross-loading of the study's variables. This is an indication that the outcomes also meet the convergent validity requirement.

Also, variance inflation factor (VIF) was adopted to check common method bias. The findings revealed that all the VIF values for each item and the measurement of all the variables are less than 3.3. This indicates that the study is free of common method bias.

**Table 1.** Confirmatory Factor Analysis (CFA).

Constructs	Loading	VIF	AVE	Compose Reliability	Cronbach's Alpha
<b>Information Sources (IS)</b>	<b>≥0.7</b>	<b>&lt;3.3</b>	<b>≥0.5</b> <b>0.590</b>	<b>≥0.8</b> <b>0.896</b>	<b>&gt;0.7</b> <b>0.860</b>
IS1	0.755	1.709			
IS2	0.752	1.754			
IS3	0.833	2.568			
IS4	0.822	2.380			
IS5	0.728	1.905			
IS6	0.711	1.663			
<b>Knowledge (Knowl)</b>			<b>0.649</b>	<b>0.902</b>	<b>0.864</b>
Knowl1	0.835	2.293			
Knowl2	0.854	2.531			
Knowl3	0.756	1.826			
Knowl4	0.755	1.826			
Knowl5	0.822	2.377			
<b>Attitude (Att)</b>			<b>0.648</b>	<b>0.846</b>	<b>0.727</b>
Att1	0.875	1.759			
Att2	0.758	1.325			
Att3	0.778	1.509			
<b>Practice (Prac)</b>			<b>0.678</b>	<b>0.863</b>	<b>0.765</b>
Prac1	0.821	1.517			
Prac2	0.828	1.657			
Prac3	0.821	1.505			

*Model fit:* The outcome as revealed in Table 2 shows that all the model fit indices are within the acceptable level. The Standardized Root Mean Square Residual (SRMR) is an indicator of standardized residual average between the observed matrix and the hypothesized covariance matrices. The SRMR measures the model fit estimation and it is reliable when its value is less than 0.08. Also, it shows that the SRMR for this study model was 0.076 which revealed a good fit for this study. The NFI estimate for this study is 0.937 which is above the benchmark of 0.90 with the chi-square value of 370.483.

**Table 2.** Model Fit.

	Estimated
SRMR	0.076
Cmin/df	2.019
d_G	0.800
Chi Square	370.483
NFI	0.937

### 3. Results

Table 3 illustrates the demographic features of respondents, revealing that females made up 52.9% of the total, compared to 47.1% for their male counterparts. This suggests that women are more likely than males to read nutritional labels because they are more concerned about their weight and the ingredients in pre-packaged foods. Some men read nutritional labels, but most do not or only look at the expiration date on pre-packaged food products. Also, 12.6% of respondents were between the ages of 18–21, 9.4% were between the ages of 22–25, 8.6% were between the ages of 26–29, 15.2% were between the ages of 30–32, 18.7% were between the ages of 33–36, 23.8% were between the ages of 37–40, and 11.8 percent were between the ages of 41 and above. This means that those who utilize nutritional labels are between 33–36, focusing on middle-aged consumers who are more likely to use labels than younger or older consumers.

**Table 3.** Demographic Characteristics of Respondents.

Selected Demographic Variables		%
Age Group	18–21	12.6
	22–25	9.4
	26–29	8.6
	30–32	15.2
	33–36	18.7
	37–40	23.7
	41 and above	11.8
Sex	Male	47.1
	Female	52.9
Educational Level	Primary	0.6
	Secondary	48.9
	Tertiary	50.5
Occupation	Student	19.3
	Entrepreneur	28.6
	White-collar Jobs	21.1
	Blue-collar job	13.1
	Unemployed	17.9
Weight	45–50 Kg	5.1
	51–55 Kg	8.3
	56–60 Kg	20.1
	61–65 Kg	23.3
	66–70 Kg	23.5
	Above 70 Kg	19.7
Total		100



Table 4 indicates how consumers make use of nutritional information sources. It was found that most (38.5%) of the respondents agree that they read the information presented on nutritional labels. Coming a close second is respondents who strongly agree that they read the information presented on nutritional labels, accounting for 32.1% of the respondents. Fifty (50) of the respondents, 13.4%, strongly disagree with the statement, leaving 16% of the respondents to disagree. This implies that most consumers read food labels for several reasons on their health, beauty, or weight. Data also show that 35% of the respondents understand the information displayed on nutritional labels. A total of 29.9% strongly agreed with this statement. However, 90 respondents, 24.1% of respondents disagreed, and 41 respondents, 11% of respondents strongly disagreed to understanding the information displayed on nutritional labels. This denotes that almost half of the respondents understand or claim to understand the information displayed on food labels. This may be because of their educational level.

**Table 4.** Consumers' use of information sources on food labelling.

	Strongly Disagree	Disagree	Agree	Strongly Agree	Total
I read the nutritional information presented on labels before I purchase a product	13.4%	16.0%	38.5%	32.1%	100
I understand the information displayed on nutritional labels	11.0%	24.1%	35.0%	29.9%	100
I use food labels for allergen information	15.5%	26.8%	31.1%	26.5%	100
I use food labels to monitor my weight	14.4%	24.9%	30.5%	30.2%	100
I use food labels for dietary considerations	17.6%	24.9%	34.2%	23.3%	100
I look at only the ingredients when I purchase pre-packaged food products	16.6%	29.7%	33.2%	20.6%	100

The results further indicate that 57% of respondents agree and strongly agree to use nutritional labels for allergen information. "Agree" has the highest frequency of respondents (31.1%), and 26.5% of the respondents strongly agreed. The respondents totalling 100, representing 26.8%, disagreed with the statement, and 15.5% strongly disagreed. There is a reduction in the percentage and number of respondents (114 consumers; 30.5%) who agree that they use nutritional labels for their weight. Respondents who disagree and strongly disagree with the statement make up 39.3% of the total respondents. This reduction can be traced to the fact that not all respondents care about their weight.

Furthermore, 57.5% of respondents strongly agree and agree (34.2% and 23.3%, respectively) with the statement that says, "I use nutritional labels for dietary considerations." This accounts for over half of the respondents, while 42.5% of the respondents (24.9% and 17.6%, respectively) disagree and strongly disagree with the statement. Also, 46.3% of the total respondents do not just look at the ingredients list when purchasing a pre-packaged food product. In contrast, 33.2% and 20.6% of the respondents agreed and strongly agreed with the statement.

Table 5 presents the relationship between the respondent's characteristics and consumer use of information sources. The age group is significantly associated with the use of information sources ( $p$ -value < 0.001). Consumers within the age group of 18–21 and 30–32 are more likely to use the information presented on food labels than consumers in other age groups, while consumers in the 37–40 age group are least likely to use the information presented on food labels. Also, occupation is significantly associated with the use of infor-

mation sources ( $p$ -value 0.020). Consumers who are white-collar workers are more likely to make use of information sources than consumers in other occupations. Unemployed consumers are least likely to make use of the information presented on food labels. Other demographic characteristics are significantly associated with the use of information sources because the  $p$ -value is  $>0.005$ .

**Table 5.** Relationship between participant demographic characteristics and consumers' use of information sources on food labelling.

		Information Use		$p$ value
		Mean	Standard Deviation	
Age Group	18–21	3.1	0.6	<0.001
	22–25	2.6	0.8	
	26–29	3.0	0.5	
	30–32	3.2	0.8	
	33–36	2.6	0.9	
	37–40	2.4	0.8	
	41 and above	2.5	0.9	
Sex	Male	2.7	0.9	0.149
	Female	2.8	0.8	
Educational Level	Primary	2.1	1.5	0.355
	Secondary	2.7	0.9	
	Tertiary	2.8	0.8	
Occupation	Student	2.8	0.8	0.020
	Entrepreneur	2.8	0.8	
	White-collar Jobs	2.9	0.9	
	Blue-collar job	2.6	0.8	
	Unemployed	2.5	0.9	
Weight	45–50 Kg	2.8	0.8	0.711
	51–55 Kg	2.7	1.0	
	56–60 Kg	2.7	0.8	
	61–65 Kg	2.8	0.8	
	66–70 Kg	2.8	0.8	
	Above 70 Kg	2.6	0.9	

Table 6 shows the respondents' knowledge on the availability of nutritional labels on pre-packaged food products and their knowledge on the location of the nutritional fact panel on the food label. Most of the respondents (152; 40.8%) agreed that food labels are available on pre-packaged food products, while 24.7% disagreed with this statement. This leaves 11.5% of the respondents strongly disagreeing with the statement, and 23.1% of the respondents strongly agree. This shows that most consumers know that food labels exist, but they do not necessarily use them. Almost half of the respondents (42.8%) agree to know where the nutrition facts panel is located on a food label, while 23.8% and 9.6% of the respondents disagree and strongly disagree on knowing the location of the nutrition facts panel.



**Table 6.** Consumers' knowledge of food labels.

	Strongly Disagree	Disagree	Agree	Strongly Agree	Total
I know about the availability of food labels on pre-package food products	11.5%	24.7%	40.8%	23.1%	100
I know where the nutritional fact panel is located on a label	9.6%	23.3%	42.8%	24.3%	100
I know how to calculate my grams intake according to per serving indicated on a food label	16.6%	32.9%	28.9%	21.7%	100
I know what the nutrients on food labels means	14.4%	25.4%	38.2%	21.9%	100
I know that the information on food labels are to be written in English, before other languages	28.1%	29.4%	28.9%	13.6%	100

Respondents amounting to 108 (28.9%) know how to calculate their gram's intake according to the per serving size on a food product, while 123 (32.9%) do not know how to calculate their gram's intake according to the per serving size. A total of 21.7% strongly agreed with the statement, and 16.6% strongly disagreed. Despite most consumers knowing about food labels, some do not know how to calculate their gram's intake. The result shows that 38.2% of the respondents agree to know what nutrients are written on the food labels. Respondents who strongly agreed with the statement amounted to 21.9%. One hundred and ten (110) respondents disagreed with this statement, accounting for 29.4%, and 14.4% strongly disagreeing.

In addition, more than half of the total respondents, 57.5%, disagreed and strongly disagreed with knowing that the information presented on a food label should first be written in the English language before any other language. A total of one hundred eight respondents (28.9%) agreed with the statement, and 13.6% of the respondents strongly agreed to the statement. This implies that over half of the total respondents do not know the regulation guidelines on food labels.

Table 7 indicates the relationship that exists between participants' characteristics and consumers' knowledge of food labels. The age group has a statistical significance with knowledge of food labels ( $p$ -value < 0.001). Consumers within the age group of 18–21 and 30–32 tend to have more knowledge about the information presented on food labels than consumers in other age groups. Consumers within the age group of 37–40 tend not to know the information presented on food labels. Also, the educational level has a statistical significance to knowledge on food labels ( $p$ -value 0.038). Consumers with tertiary education have more knowledge than consumers with just a primary or secondary school education. The table shows that consumers with a primary school education have more knowledge, but that is not statistically possible because only two respondents said they had just a primary school education. Finally, occupation is significantly associated with knowledge of food labels ( $p$ -value 0.001). Consumers that are students or white-collar workers tend to have more knowledge of the information that is presented on food labels.

**Table 7.** Relationship between participant demographic characteristics and consumers' knowledge of food labels.

		Knowledge		p value
		Mean	Standard Deviation	
Age Group	18–21	3.0	0.7	<0.001
	22–25	2.5	0.7	
	26–29	2.7	0.5	
	30–32	3.1	0.7	
	33–36	2.4	0.8	
	37–40	2.4	0.7	
	41 and above	2.4	0.8	
Sex	Male	2.6	0.8	0.276
	Female	2.7	0.8	
Educational Level	Primary	3.4	0.8	0.038
	Secondary	2.5	0.8	
	Tertiary	2.7	0.8	
Occupation	Student	2.8	0.7	0.001
	Entrepreneur	2.7	0.8	
	White-collar Jobs	2.8	0.7	
	Blue-collar job	2.4	0.8	
	Unemployed	2.3	0.8	
Weight	45–50 Kg	2.6	0.7	0.539
	51–55 Kg	2.6	0.8	
	56–60 Kg	2.5	0.9	
	61–65 Kg	2.7	0.8	
	66–70 Kg	2.7	0.8	
	Above 70 Kg	2.6	0.8	

Table 8 indicates the attitudes of consumers of pre-packaged food products towards nutritional labels. Some consumers agree with the statement, “*I consciously search for nutritional information before the purchase a food product.*” These respondents amount to 33.8%, while 24.1% of respondents strongly agree with this statement. However, 114 respondents, 30.6%, disagree with this statement, and 11.5% of the respondents strongly disagree with the statement. This implies that most consumers check the information displayed on food labels, which means they have a positive attitude towards food labels. The respondents totalling 221 agree and strongly agree that they understand the content on a nutritional facts panel consciously. These respondents account for 59%, over half of the total respondents. A total of 28.6% disagree with this statement and 12.3% strongly disagree with the statement.

**Table 8.** Consumers' attitudes towards food labels.

	Strongly Disagree	Disagree	Agree	Strongly Agree	Total
I consciously search for nutritional information before I purchase a food product	11.5%	30.6%	33.8%	24.1%	100
I seek to understand content on nutritional labels	12.3%	28.6%	39.0%	20.1%	100

Table 9 represents the relationship between the respondents' characteristics and the consumers' attitude towards food labels. The age group is significantly associated with attitude towards food labels ( $p$ -value 0.001). Consumers within the age group of 18–21 and 30–32 have a positive attitude towards food labels than the consumers in other age groups. Also, occupation is statistically significant to attitude towards food labels ( $p$ -value 0.007). Consumers who are white-collar workers have a positive attitude towards food labels compared to consumers that have a different occupation.

**Table 9.** Relationship between participant characteristics and consumers' attitude towards food labels.

		Attitude		$p$ value
		Mean	Standard Deviation	
Age Group	18–21	3.0	0.7	<0.001
	22–25	2.5	0.9	
	26–29	2.8	0.5	
	30–32	3.2	0.7	
	33–36	2.4	0.9	
	37–40	2.5	0.9	
	41 and above	2.6	1.0	
Sex	Male	2.7	0.9	0.776
	Female	2.7	0.8	
Educational Level	Primary	3.5	0.0	0.067
	Secondary	2.6	0.9	
	Tertiary	2.8	0.9	
Occupation	Student	2.7	0.8	0.007
	Entrepreneur	2.7	0.9	
	White-collar Jobs	2.9	0.8	
	Blue-collar job	2.6	1.0	
	Unemployed	2.4	0.9	
Weight	45–50 Kg	2.7	0.8	0.403
	51–55 Kg	2.7	0.7	
	56–60 Kg	2.6	0.9	
	61–65 Kg	2.6	0.8	
	66–70 Kg	2.9	0.9	
	Above 70 Kg	2.7	1.0	

Results from Table 10 show that 33.7% of respondents' buying decisions are influenced by nutritional information on food products. This shows that these respondents check nutritional labels before purchasing a pre-packaged food product. This implies that 42.5% of the respondents purchase pre-packaged food products without necessarily checking the nutritional label. A total of one hundred sixteen respondents (31%) agreed to look at dietary guidelines before making a purchase, while 26.7% disagreed with this statement. A total of 25.4% of the respondents strongly agreed, and 16.8% of the respondents strongly disagreed.

**Table 10.** Consumers' practice towards food labels.

	Strongly Disagree	Disagree	Agree	Strongly Agree	Total
My buying decisions is influenced by nutritional information on products	12.0%	30.5%	33.7%	23.8%	100
I look at the dietary guidelines before making purchase	16.8%	26.7%	31.0%	25.4%	100

Table 11 shows the relationship that exists between participant characteristics and consumers' practice towards food labels. The age group is statistically significant with practice towards food labels ( $p$ -value 0.001). Consumers within the age group of 18–21 and 30–32 use the information presented on food labels more than consumers in other age groups. Furthermore, occupation is significantly associated with practice towards food labels ( $p$ -value 0.003). Consumers who are students or white-collar workers make use of the information presented on food labels more than consumers in other occupations.

**Table 11.** Relationship between participant characteristics and consumers' practice towards food labels.

		Practice		$p$ value
		Mean	Standard Deviation	
Age Group	18–21	3.2	0.7	<0.001
	22–25	2.5	0.9	
	26–29	2.8	0.7	
	30–32	3.2	0.8	
	33–36	2.4	1.0	
	37–40	2.5	0.9	
	41 and above	2.4	1.0	
Sex	Male	2.7	1.0	0.825
	Female	2.7	0.9	
Educational Level	Primary	2.3	0.4	0.095
	Secondary	2.6	0.9	
	Tertiary	2.8	0.9	
Occupation	Student	2.9	0.9	0.003
	Entrepreneur	2.7	0.9	
	White-collar Jobs	2.9	0.9	
	Blue-collar job	2.5	0.9	
	Unemployed	2.3	0.9	

Table 11. Cont.

		Practice		<i>p</i> value
		Mean	Standard Deviation	
Weight	45–50 Kg	3.0	0.9	0.132
	51–55 Kg	2.7	0.8	
	56–60 Kg	2.5	1.0	
	61–65 Kg	2.6	1.0	
	66–70 Kg	2.8	0.8	
	Above 70 Kg	2.6	1.0	

#### 4. Discussion

The importance of nutritional data sources cannot be overstated. According to Osei et al. [26], the information on food labels is vital to consumers since it allows them to evaluate a food product before purchasing it. The majority of respondents read the information on food labels, according to the findings of this study. This is most likely due to the importance of food labels in helping individuals choose healthier and better dietary choices. Consumers read, understand, trust the authenticity, and are considerably aware of nutritional labelling, according to Oghojafor et al. [5], and relate the impacts of nutrition information to their health. It was also discovered that, compared to other age groups, consumers between the ages of 26 and 36 use the information on food labels. This indicates that consumers who utilise nutritional labels are between 26 and 36, focusing on middle-aged consumers who are more likely to use labels than younger or older consumers. According to Andrews et al. [10], the lower use of nutritional labels among older consumers is because they found it less understandable. Also, studies by Balasubramanian and Cole [27] and Kim et al. [28] show that as age increases, the use of nutritional labels among consumers decreases. Contrarily, studies by Govindasamy and Italia [29], Coulson [30], and Drichoutis et al. [31] found that nutritional labels usage was proportional to an increase in age. These studies observed that consumers in the age category of 45 and above become more cautious about what they eat due to various medical reasons compared to younger consumers.

Gender has a significant but indirect effect on the use of food labels, according to Grunert et al. [32], as women are more engaged in healthy eating. This is because females tend to be more conscious of their weight than males, and also, females are conscious about the ingredients that make up a food product and how the ingredients affect their health. In addition, research done in the United Kingdom and the United States discovered that while purchasing food products, women were more likely than males to study the nutritional labels [33].

The majority of respondents have a good understanding of food labels, according to the findings. This suggests that over half of the respondents use the information on food labels and comprehend what the information means, which has a long-term impact on consumers' willingness to use food labels. According to Shine et al. [34], there is a link between respondents' perceived nutrition knowledge and their use of nutrition labels. Furthermore, Drichoutis et al. [31] found that having a good understanding of nutrition had a substantial impact on nutritional labels by improving the benefits and efficiency.

Drichoutis et al. [31] also found that just as nutrition knowledge influences label use, label use influences nutrition knowledge. On the other hand, Grunert et al. [32] discovered that nutrition education did not affect nutritional label use. Nutritional information was primarily used for healthy eating rather than nutritional expertise, according to the study. According to the findings, the majority of respondents with a tertiary degree had more awareness of food labels than those who stopped at secondary school. This means that the greater a person's educational level is, the more nutritional information they know and

understand. According to Brecher et al. [35], consumers with a higher educational level are more likely to use food labels than those with a lower educational level.

Singla [36] has also observed that the educational level has a substantial impact on the ease of use of nutritional labels, with consumers with a higher level of education finding food labels easier to read and understand than those with a lower level of education. Consumers without a tertiary education complained about not understanding the terminology used in the study, indicating that higher-level education is required to make nutritional information more accessible.

Researchers have cited nutrition labels as a valuable source of information. However, the importance of the components and health claims may be overstated. Also, consumers' perceptions about the healthiness of foods did not always depend on information on the label [37].

According to the survey, the majority of respondents had a good attitude toward comprehending the content of food labels and intentionally searching for nutritional information before purchasing a food product. This shows that customers are aware of food labels and go to great lengths to find nutritional information and comprehend it. The data also demonstrated that a consumer's educational level has a strong correlation with their attitude. According to Susan Fullmer MS [38], consumers with a greater level of education have a better grasp of the risk of diet-related diseases and, as a result, have a more positive attitude toward food labels. According to Campos et al. [37], consumers have negative opinions about food labels when the information offered on labels is misleading, and the labels violate regulatory regulations. This theory describes the influences on behaviours that entail conscious decision-making concerning the theoretical framework "*the theory of reasoned action and the theory of planned behaviour*." Using both attitude and normative elements, the theory also predicts behavioural intention. It is worth noting that both aspects can influence behavioural intent simultaneously, with one's attitude influencing their intention to carry out a specific behavioural activity [39]. Therefore, a consumer's good or negative attitude toward food labels influences the consumer's intention to use food labels, which determines the consumer's behaviour when using food labels.

The findings demonstrated that the nutritional information on a food label has an influence on respondents' purchasing decisions. This means that while considering whether or not to buy a product, consumers consider nutritional information. As a result, nutritional information has discernible impact on customer purchasing decisions as observed by the findings of Borra [40–42] that consumers study the nutrition facts panel on food labels, which includes the number of calories, fats, carbohydrates, and sugars.

## 5. Limitations of the Study

This study was conducted among an urban population of Lagos state, to the neglect of semi-urban as well as rural residents of the state and other geopolitical zones of Nigeria. Including samples from these regions would have further improved the robustness of data, allowing for a richer comparative study and generalizability across the country. Furthermore, this study substantially depended on self-reported data and this is limited by facts that can rarely be independently verified. Consequently, the researcher had to accept the views of the respondents to the interviews and questionnaires at face value. Self-reported data have several potential sources of biases that serve as limitations to this study.

## 6. Conclusions

The study examined the awareness, attitude of consumers towards label information on fast moving consumer goods covering central business district of a developing nation, Nigeria, as distinct from numerous studies with a focus on industrialised economies such as the United States, France, United Kingdom and Germany. Evidence from the study highlighted that the reading, comprehension of information on nutritional labels among the consumers is not uniform, and that food labels also have an impact on most people's



purchasing decisions. Data on the knowledge, attitude and practice of Nigerians towards nutritional labels will therefore enable concerned agencies such as National Agency for Food Drugs Administration and Control (NAFDAC), Standards Organisation of Nigeria (SON), National Codex Committee (NCC) to take proactive steps, in enunciating policies. The study concluded that consumer use of labelling information is an important means of nutritional education that could possibly reduce vulnerability to diet-related diseases.

**Author Contributions:** Conceptualization, E.A and B.A. (Boluwatife Ajayi); Data curation, E.A., B.A. (Babatunde Adeyeye) and E.O.A.; Formal analysis, B.A. (Boluwatife Ajayi); Investigation, E.O.A. and E.A.; Methodology, A.O.-I. and T.O.; Resources, T.O.; Supervision, E.A. and E.O.A.; Writing—Original draft, E.A. and B.A. (Boluwatife Ajayi); Writing—Review & editing, M.P.A., M.E.U. and E.A. All authors have read and agreed to the published version of the manuscript.

**Funding:** We appreciate the Covenant University Centre for Research, Innovation and Discovery (CUCRID) for the financial support for this publication.

**Informed Consent Statement:** Informed consent was obtained from all subjects involved in the study.

**Conflicts of Interest:** The authors declare no conflict of interest.

## References

1. Lekhanya, L.M.; Olajumoke, N.G.; Nirmala, D. Exploring fast moving consumer goods (FMCG) small, medium and micro enterprises manufacturers' need for innovation to achieve growth. *Environ. Econ.* **2017**, *8*, 8–16. [CrossRef]
2. Agarwal, B. Food sovereignty, food security and democratic choice: Critical contradictions, difficult conciliations. *J. Peasant Stud.* **2014**, *41*, 1247–1268. [CrossRef]
3. Hawkes, C.; World Health Organization. *Nutrition Labels and Health Claims: The Global Regulatory Environment*; World Health Organization: Geneva, Switzerland, 2004.
4. Modo. Consumer Perception and Use of Nutritional Labeling during Purchase. Available online: [https://www.academia.edu/9976739/Consumer\\_Perception\\_and\\_Use\\_of\\_Nutritional\\_Labeling\\_During\\_Purchase](https://www.academia.edu/9976739/Consumer_Perception_and_Use_of_Nutritional_Labeling_During_Purchase) (accessed on 23 August 2021).
5. Oghojafor, B.; Ladipo, P.; Nwagwu, K.O. An Empirical Determination of Consumers' Reaction to Nutritional Labeling of Prepackaged Food Products in Lagos, Nigeria. 2012. Available online: <https://ir.unilag.edu.ng/handle/123456789/2498> (accessed on 25 April 2021).
6. Jáuregui, A.; Vargas-Meza, J.; Nieto, C.; Contreras-Manzano, A.; Alejandro, N.Z.; Tolentino-Mayo, L.; Hall, M.G.; Barquera, S. Impact of front-of-pack nutrition labels on consumer purchasing intentions: A randomized experiment in low- and middle-income Mexican adults. *BMC Public Health* **2020**, *20*, 463. [CrossRef] [PubMed]
7. Jáuregui, C.E. Consumers' Use of Food Labels: An Application of Ordered Probit Models. Ph.D. Thesis, University of Florida, Gainesville, FL, USA, 2007.
8. Donga, G.; Patel, N. A review of research studies on factors affecting consumers' use of nutritional labels. *Nutr. Food Sci. Int. J.* **2018**, *7*, 555713.
9. Kaur, V.P.; Kaur, N.; Kumar, N. Assessment of consumer awareness about usage of food labels and its impact on food buying behavior. *Int. J. Res. Granthaalayah* **2016**, *4*, 10–19. [CrossRef]
10. Andrews, J.C.; Netemeyer, R.G.; Burton, S. The nutrition elite: Do only the highest levels of caloric knowledge, obesity knowledge, and motivation matter in processing nutrition ad claims and disclosures? *J. Public Policy Mark.* **2009**, *28*, 41–55. [CrossRef]
11. Cannoosamy, K.; Pugo-Gunsam, P.; Jeewon, R. Consumer knowledge and attitudes toward nutritional labels. *J. Nutr. Educ. Behav.* **2014**, *46*, 334–340. [CrossRef]
12. World Health Organization. *The State of Food Security and Nutrition in the World 2018: Building Climate Resilience for Food Security and Nutrition*; Food & Agriculture Organization: Rome, Italy, 2018.
13. Amugsi, D.A.; Dimbuene, Z.T.; Kyobutungi, C. Correlates of the double burden of malnutrition among women: An analysis of cross sectional survey data from sub-Saharan Africa. *BMJ Open* **2019**, *9*, e029545. [CrossRef]
14. Amugsi, D.A.; Dimbuene, Z.T.; Mberu, B.; Muthuri, S.; Ezech, A.C. Prevalence and time trends in overweight and obesity among urban women: An analysis of demographic and health surveys data from 24 African countries, 1991–2014. *BMJ Open* **2017**, *7*, e017344. [CrossRef]
15. Chukwuonye, I.I.; Chuku, A.; John, C.; Ohagwu, K.A.; Imoh, M.E.; Isa, S.E.; Ogah, O.S.; Oviasu, E. Prevalence of overweight and obesity in adult Nigerians—A systematic review. *Diabetes Metab. Syndr. Obes. Targets Ther.* **2013**, *6*, 43–47. [CrossRef]
16. Danilola, S.T.; Omotesho, O.A.; Animashaun, J. Consumer awareness of the use of food labels in Lagos state, Nigeria. *Int. J. Food Stud.* **2019**, *8*, 53–64. [CrossRef]
17. Food Safety and Applied Nutrition (FSAN). 2018. Available online: [www.nafdac.gov.ng/index.php/about-nafdac/directorates/food-safety-applied-nutrition](http://www.nafdac.gov.ng/index.php/about-nafdac/directorates/food-safety-applied-nutrition) (accessed on 25 April 2021).

18. Krešić, G.; Mrduljaš, N. The relationship between knowledge and the use of nutrition information on food package. *Acta Aliment.* **2016**, *45*, 36–44.
19. Lynam, A.-M.; McKevitt, A.; Gibney, M.J. Irish consumers' use and perception of nutrition and health claims. *Public Health Nutr.* **2011**, *14*, 2213–2219. [[CrossRef](#)]
20. Moore, S.G.; Donnelly, J.K.; Jones, S.; Cade, J.E. Effect of educational interventions on understanding and use of nutrition labels: A systematic review. *Nutrients* **2018**, *10*, 1432. [[CrossRef](#)]
21. Ponto, J. Understanding and evaluating survey research. *J. Adv. Pract. Oncol.* **2015**, *6*, 168.
22. Aluko, O. The effects of location and neighbourhood attributes on housing values in metropolitan Lagos. *Ethiop. J. Environ. Stud. Manag.* **2011**, *4*, 69–82. [[CrossRef](#)]
23. Israel, G.D. Determining Sample Size. 1992. Available online: [https://www.researchgate.net/profile/Subhash-Basu-3/post/how\\_could\\_i\\_determine\\_sample\\_size\\_for\\_my\\_study/attachment/5ebaa4924f9a520001e613b6/AS%3A890361492811785%401589290130539/download/samplesize1.pdf](https://www.researchgate.net/profile/Subhash-Basu-3/post/how_could_i_determine_sample_size_for_my_study/attachment/5ebaa4924f9a520001e613b6/AS%3A890361492811785%401589290130539/download/samplesize1.pdf) (accessed on 25 April 2021).
24. Guttman, L. A basis for analyzing test-retest reliability. *Psychometrika* **1945**, *10*, 255–282. [[CrossRef](#)]
25. Cronbach, L.J. Test “reliability”: Its meaning and determination. *Psychometrika* **1947**, *12*, 1–16. [[CrossRef](#)]
26. Osei, M.J.; Lawer, D.; Aidoo, R. Consumers' use and understanding of food label information and effect on their purchasing decision in Ghana; a case study of Kumasi metropolis. *Asian J. Agric. Rural Dev.* **2013**, *2*, 351–365.
27. Balasubramanian, S.K.; Cole, C. Consumers' search and use of nutrition information: The challenge and promise of the nutrition labeling and education act. *J. Mark.* **2002**, *66*, 112–127. [[CrossRef](#)]
28. Kim, S.-Y.; Nayga, R.M., Jr.; Capps, O., Jr. The effect of food label use on nutrient intakes: An endogenous switching regression analysis. *J. Agric. Resour. Econ.* **2000**, *25*, 215–231.
29. Govindasamy, R.; Italia, J. The influence of consumer demographic characteristics on nutritional label usage. *J. Food Prod. Mark.* **2000**, *5*, 55–68. [[CrossRef](#)]
30. Coulson, N.S. An application of the stages of change model to consumer use of food labels. *Br. Food J.* **2000**, *102*, 661–668. [[CrossRef](#)]
31. Drichoutis, A.C.; Lazaridis, P.; Nayga, R.M., Jr. Consumers' use of nutritional labels: A review of research studies and issues. *Acad. Mark. Sci. Rev.* **2006**, *2006*, 1–22.
32. Grunert, K.G.; Wills, J.M.; Fernández-Celemin, L. Nutrition knowledge, and use and understanding of nutrition information on food labels among consumers in the UK. *Appetite* **2010**, *55*, 177–189. [[CrossRef](#)]
33. Cowburn, G.; Stockley, L. Consumer understanding and use of nutrition labelling: A systematic review. *Public Health Nutr.* **2005**, *8*, 21–28. [[CrossRef](#)]
34. Shine, A.; O'Reilly, S.; O'Sullivan, K. Consumer use of nutrition labels. *Br. Food J.* **1997**, *99*, 290–296. [[CrossRef](#)]
35. Brecher, S.J.; Bender, M.M.; Wilkening, V.L.; McCabe, N.M.; Anderson, E.M. Status of nutrition labeling, health claims, and nutrient content claims for processed foods: 1997 Food Label and Package Survey. *J. Am. Diet. Assoc.* **2000**, *100*, 1057–1062. [[CrossRef](#)]
36. Singla, M. Usage and understanding of food and nutritional labels among Indian consumers. *Br. Food J.* **2010**, *112*, 83–92. [[CrossRef](#)]
37. Campos, S.; Doxey, J.; Hammond, D. Nutrition labels on pre-packaged foods: A systematic review. *Public Health Nutr.* **2011**, *14*, 1496–1506. [[CrossRef](#)]
38. Fullmer, S.; Geiger, C.J.; Parent, C.R.M. Consumers' knowledge, understanding, and attitudes toward health claims on food labels. *J. Am. Diet. Assoc.* **1991**, *91*, 166–171. [[CrossRef](#)]
39. Oyero, O.; Oyesomi, K.; Abioye, T.; Ajiboye, E.; Kayode-Adedeji, T. Strategic communication for climate change awareness and behavioural change in Ota Local Government of Ogun State. *Afr. Popul. Stud.* **2018**, *32*, 4057–4067.
40. Borra, S. Consumer perspectives on food labels. *Am. J. Clin. Nutr.* **2006**, *83*, 1235S. [[CrossRef](#)] [[PubMed](#)]
41. Adesina, E.; Oyero, O.; Amodu, L.; Amoo, E.; Oyesomi, K.; Adeyeye, B.; Yartey, D. Health belief model and behavioural practice of urban poor towards COVID-19 in Nigeria. *Heliyon* **2021**, *7*, e08037. [[CrossRef](#)]
42. Amoo, E.O.; Oni, G.A.; Obayan, A.; Alao, A.A.; Adekeye, O.A.; Samuel, G.W.; Oyegbile, S.A.; Adesina, E. Analysis of Residents' Preparedness Protocols during Ebola Pandemic in Urban Environment. *Sustainability* **2021**, *13*, 8934. [[CrossRef](#)]