



Assessment of Consumers' Knowledge and Their Use of Nutritional Facts on Food Labels for Saudi and Non-Saudi Individuals During Umrah Period

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Abstract

Introduction: The nutritional facts on food labels provide a consumer with the easiest way to select food based on its nutritional facts which are located on the food label. Adding nutrition content on food labels could be one of the most effective tools for communicating nutritional information to consumers. **Method:** Saudi and non-Saudi pilgrims during Umrah period among the population aged ≥ 18 years. The study comprised a structured questionnaire packet that inquired about demographic information (gender, nationality, marital status, education level, age, employment, monthly income (Saudi Arabian riyals) SAR, medical diagnosis, and food allergy. The survey was conducted from 23 March to 20 April 2023. All data were collected using an online self-reported questionnaire, using Google Forms. Given the high internet usage among people in the KSA, the link of the online questionnaire was distributed to the target population, and various media platforms, including Email, Google Drive, and WhatsApp groups, and their responses were collected. **Results:** Our study showed the knowledge of the consumers and their use of nutritional facts on food labels for Saudi and non-Saudi individuals during Umrah period, most of the research sample individuals were Women at a rate of 54.7%, and 60.7% of the research sample individuals were Saudi. According to Marital states, 48.7% were Married by Divorced, Single, and Widowed at the rate of, 24, 16, and 11.3% respectively. In addition, educated individuals with a Bachelor's degree were more aware of nutritional facts on food labels than a High School or Master / Ph.D. It is clear that 62 of the research sample individuals their aged between 30 to 40 years followed by 49 aged 41 years or more and 39 of the research sample individuals aged less than 30 years. Based on the Medical diagnosis, our results display that, most of the research sample individuals were Hypertension which counted 39 of the total individuals followed by Diseases free, Cardiovascular, Asthma, Diabetes, Iron deficiency (anemia), Liver diseases, Cancer, and Thyroid respectively. The majority of the individuals were allergic to foo at about 62% while 38%. Moreover, 70.7% of the research sample individuals were aware that packaged foods have labels, and 50% of them were always reading food labels followed by 30.7% Sometimes reading and 19.3% they are never reading. 92% of the research sample individuals believed labels were helpful when purchasing. **Conclusion:** From the results, it can be concluded that more than half of the sample individuals mentioned that they were aware that packaged foods have labels, and 50% of them were always reading food labels, It also indicates that the majority of respondents who are reading food labels who are Hypertension patients, Cardiovascular, Asthma, Diabetes, Iron deficiency (anemia), Liver diseases, Cancer, and Thyroid which means they are reading based on their high awareness of the strong relation between their health condition and food. The results also indicate that nutrition information awareness and reading do

CC License CC-BY-NC-SA 4.0	<i>not significantly differ according to gender at the same time they differ based on nationality whereas Saudi individuals were more aware than non-Saudi.</i> Keywords: Knowledge, Nutritional facts, Food labels, Saudi, Pilgrims, Umrah
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1. Introduction

A food label can be defined as any tag, mark, pictorial, or other descriptive text, written, or printed, attached to a pre-packaged food container (AlMughthem et al., 2020). The nutritional facts provide a consumer with the easiest way to select food based on its nutritional facts which are located on the food label. Adding nutrition content on food labels could be one of the most effective tools for communicating nutritional information to consumers (Miller and Cassady, 2015). Nutritional facts on food labels explain a product's composition of nutrients, such as carbohydrates, protein, fat, food preservatives, and additives (Jáuregui et al., 2020).

According to NAFDAC, a food label must contain a nutritional facts label, characteristics of the food product name, net contents, manufacturer's name, and address (Adesina et al., 2022). The food product name must feature the product's common name and brand and may include a picture. Net contents should consist of information that represents the entire weight, including liquid, the amount listed is in metric measures (grams/millilitres) (Adesina et al., 2022). The most and main nutritional information on food labels such as a list of ingredients, nutritional content, serving size, and health benefits, all this information may help consumers to understand the nutritional composition of a chosen product and make their decisions based on nutritional information (Miller and Cassady, 2015).

The four main sections of a nutrition facts label, are highlighted in colour which are, serving size information, calorie information, nutrient amounts, and percent daily values (Saudi Ministry of Health).

Optimal nutrition intake is one of the most lifestyle factors that contribute to a reduced incidence of contemporary diseases such as obesity, diabetes, and cardiovascular diseases (Ezzati & Riboli, 2013). The effort of public health agencies to help consumers choose healthy food and encourage them to use the nutrition facts on food labels can be an effective approach to the prevalence of the use of food label content (Miller and Cassady, 2015).

Using nutrition content on food labels is prevalent in the countries given the continued growth of online food shopping (Grunert et al., 2010). In addition, the research in this area of knowledge of food label use for pilgrims is limited. Despite that, there is some previous research that reported that there is a connection between healthier dietary decisions and knowledge regarding the nutritional facts label (Williams, 2005). For instance, Arsenault et al, (2014) reported that the use of dietary fat was 6% less for consumers who used the nutrition facts label compared with those who did not use it (Fitzgerald et al., 2008 and Arsenault et al., 2014). Moreover, Korean research indicated that there is a connection between reading the nutrition facts on a food label and macro-nutrients and micro-nutrients intake between adults showed that males who used the nutrition facts on food labels had higher consumptions of vitamin C and calcium than those who did not, it also indicated that females consumed fewer calories than those who did not.

From the same previous study, individuals with high education levels and high incomes were more to use nutrition facts on food labels. the most common individual who uses the nutritional facts on food labels are consumers with some diseases such as diabetes, hypertension, or food allergy (Kim et al., 2014). Furthermore, some consumers who are reading the nutrition facts on food labels mostly concentrate on calories, fat, and sugar information when purchasing uncommon foods (BA et al., 2004).

Current research indicated that their consumers do not use all the information on food labels. This could be due to the ignoramus of the importance of nutrition facts (Grunert et al., 2010 and Whitney et al., 2023 and Annunziata and Mariani, 2019). Some studies have also revealed that most consumers do not understand nutritional facts on food labels and cannot calculate their dietary requirements (AlMughthem et al., 2020). Currently, there are many studies on nutritional facts on food labels have been conducted in developed countries such as the United Kingdom, the United States, and Ireland (Jáuregui et al., 2020) and (Cannoosamy et al., 2014). Whereas a small number of studies have been conducted in Middle Eastern countries such as Saudi Arabia, as a result, the main purpose of this study

is to assess consumers' knowledge and their use of food labelling information during Umrah period for Saudi and non-Saudi pilgrims.

2. Materials and Methods

This study aimed to assess consumer's knowledge and their use of nutritional facts on food labels for Saudi and non-Saudi pilgrims during Umrah period among the Saudi and non-Saudi population aged ≥ 18 years. The study comprised a structured questionnaire packet that inquired about demographic information (gender, nationality, marital status, education level, age, employment, monthly income (Saudi Arabian riyals) medical diagnosis, and food allergy.

The survey has used the information on food labels including: (Are you aware that packaged foods have labels? How often do you read food labels? Do you consider labels when buying packaged foods? Are labels helpful when purchasing foods?). It also has consumer's knowledge of food labels which are (I know about the availability of food labels on food products, I understand the nutritional information shown on food labels, I use food labels information for food allergen, I use food labels to control my daily calories intake, I only look at the components on the labels when I purchase canned food, I only read the information on food labels when it's in the Arabic language and I know how to read and calculate my nutrient need based on the food label information). The survey was conducted from 23 March to 20 April 2023.

All data were collected using an online self-reported questionnaire, using Google Forms. Given the high internet usage among people in the KSA, the link of the online questionnaire was distributed to the target population, and various media platforms, including Email, Google Drive, and WhatsApp groups, and their responses were collected.

Sample size and statistical analysis: The collected data (n=150) from Saudi and non-Saudi participants were analyzed by using IBM SPSS Statistics 23 Version.

Sincerity and Reliability

Sincerity of the questionnaire:

It means the ability of the questionnaire to measure what it was put to measure it. Sincerity by using the internal consistency between the degree of each phrase and the total degree for the questionnaire: Sincerity has been calculated using internal consistency by calculating the correlation coefficient (Pearson correlation coefficient) between the degree of each phrase and the total degree for the questionnaire (Women's Empowerment); and the following table shows this:

Table (1) values of the correlation coefficients between the degree of each phrase and the degree of the questionnaire

No	Correlations	Sig
1-	0.756	0.01
2-	0.908	0.01
3-	0.882	0.01
4-	0.701	0.01
5-	0.856	0.01
6-	0.640	0.05
7-	0.778	0.01
8-	0.935	0.01
9-	0.813	0.01
10-	0.623	0.05
11-	0.607	0.05

It is clear from the table that all the correlation coefficients are significant at the level (0.01- 0.05) because they are close to the whole one, which indicates the validity and homogeneity of the questionnaire statements.

Reliability:

Reliability means the test accuracy in the measurement and observation, not a contradiction with itself, and its consistence in providing us with information about the examiner's behavior, and it is the ratio between the score difference on the scale, which refers to the actual performance of the examiner. The reliability has been calculated by:

1- Alpha Cronbach coefficient

2- Split-half method

Table (2) values of the reliability coefficient of the questionnaire

	Cronbach's Alpha	Split-half
Reliability of the questionnaire as whole	0.852	0.796 – 0.928

It is clear from the previous table that the all values of the reliability coefficients: the Alpha coefficient, the Split-half are significant at the level of 0.01 and that indicates the reliability of the questionnaire.

Demographic information

Description of the study sample:

The following is a comprehensive description of the study sample, shown in tables from (3 to 27) and charts from (1 to 19), and that in terms of: 1-Gender: Table (3) and Chart (1) show the distribution of the research sample individuals according to the Gender variable

Table (3) Distribution of the research sample individuals according to the Gender variable

Gender	Number	Percentage
Men	68	45.3%
Women	82	54.7%
Sum	150	100%

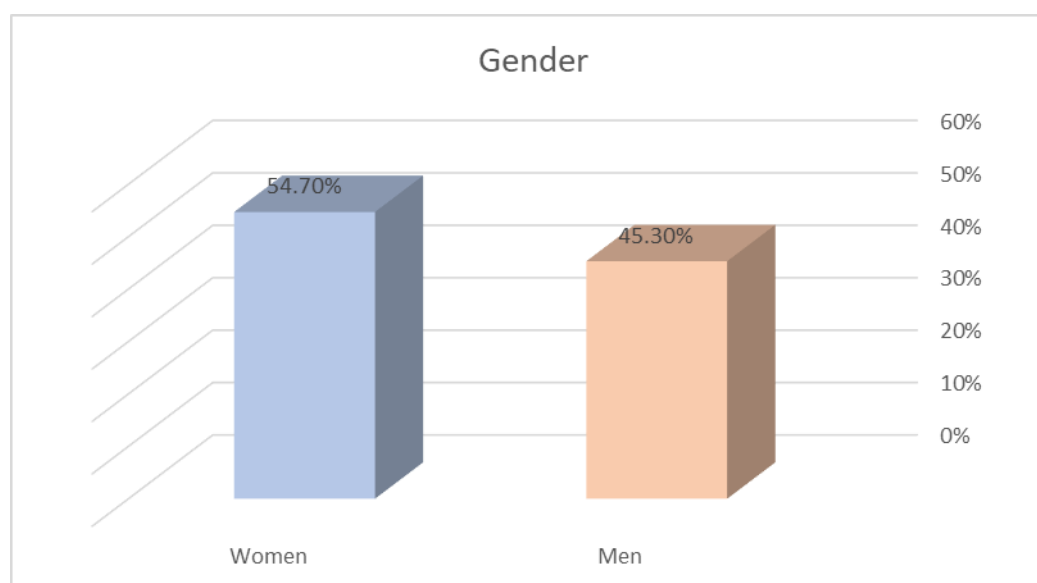


Chart (1) shows the distribution of the research sample individuals according to the Gender variable. From Table (3) and Chart (1), it is clear that 82 of the research sample individuals are Women by 54.7%, while 68 from the research sample individuals are Men by 45.3%.

Nationality:

Table (4) and Chart (2) show the distribution of the research sample individuals according to the Nationality variable.

Table (4) Distribution of the research sample individuals according to the Nationality variable

Nationality	Number	Percentage
Saudi	91	60.7%
Non-Saudi	59	39.3%
Sum	150	100%

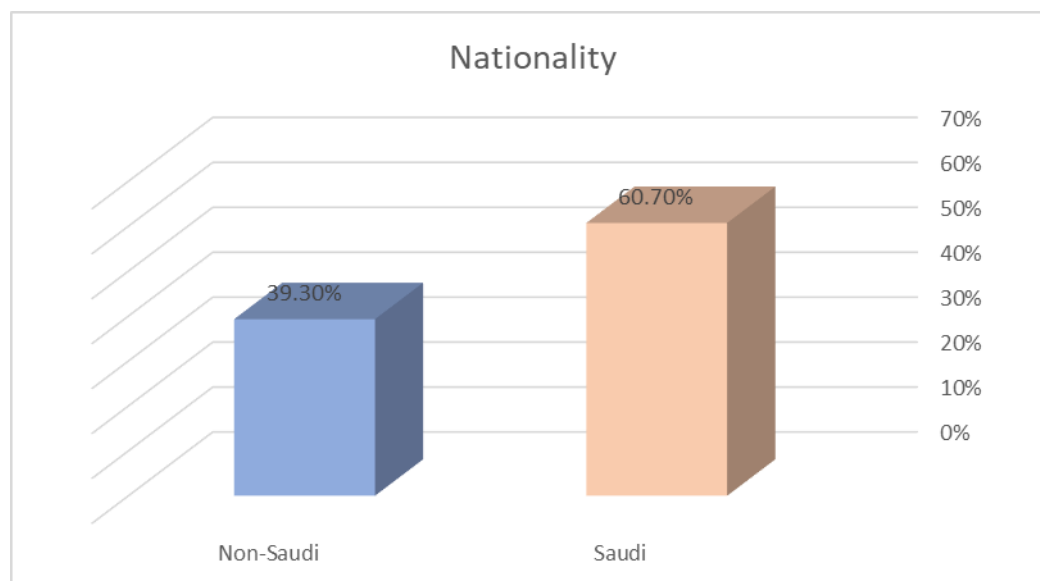


Chart (2) shows the distribution of the research sample individuals according to the Nationality variable

From table (4) and chart (2), it is clear that 91 of the research sample individuals are Saudi by 60.7%, while 59 of the research sample individuals Non-Saudi by 39.3%.

Marital status:

Table (5) and Chart (3) show the distribution of the research sample individuals according to the Marital status variable

Table (5) Distribution of the research sample individuals according to the Marital status variable

Marital status	Number	Percentage
Single	24	16%
Married	73	48.7%
Divorced	36	24%
Widowed	17	11.3%
Sum	150	100%

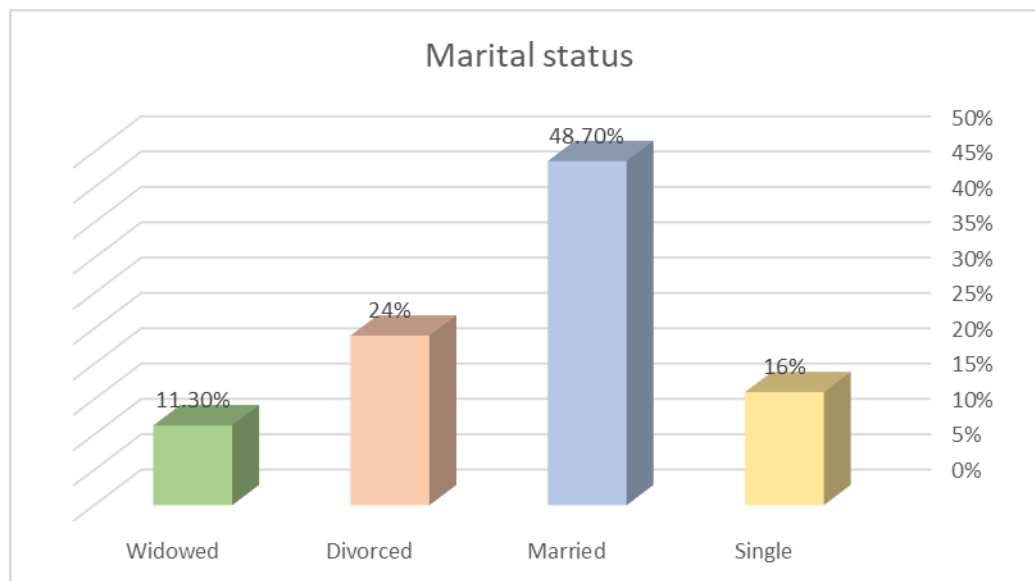


Chart (3) shows the distribution of the research sample individuals according to the Marital status variable

From table (5) and chart (3), it is clear that 73 of the research sample individuals are Married by 48.7%, followed by 36 of the research sample individuals are Divorced by 24%, and then comes in the third place 24 of the research sample individuals are Single by 16%, and finally 17 from the research sample individuals are Widowed by 11.3%.

Education:

Table (6) and Chart (4) show the distribution of the research sample individuals according to Education variable

Table (6) Distribution of the research sample individuals according to Education variable

Education	Number	Percentage
High School or Diploma	41	27.3%
Bachelor	86	57.3%
Masters / PhD	23	15.3%
Sum	150	100%

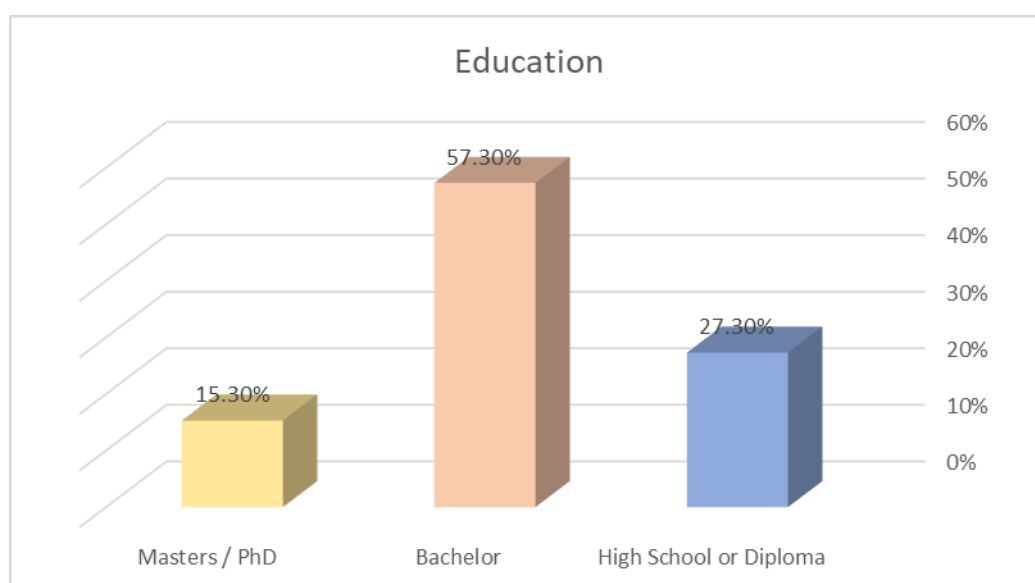


Chart (4) shows the distribution of the research sample individuals according to Education variable.

From Table, (6) and Chart (4), it is clear that 86 of the research sample individuals have a Bachelor's degree by 57.3%, followed by 41 of the research sample individuals have a High School or Diploma by 27.3%, and then comes in the third place 23 of the research sample individuals have a Masters / PhD by 15.3%.

Age: Table (7) and Chart (5) show the distribution of the research sample individuals according to the Age variable.

Table (7) Distribution of the research sample individuals according to the Age variable

Age	Number	Percentage
Less than 30 years	39	26%
From 30 to 40 years	62	41.3%
From 41 years or more	49	32.7%
Sum	150	100%

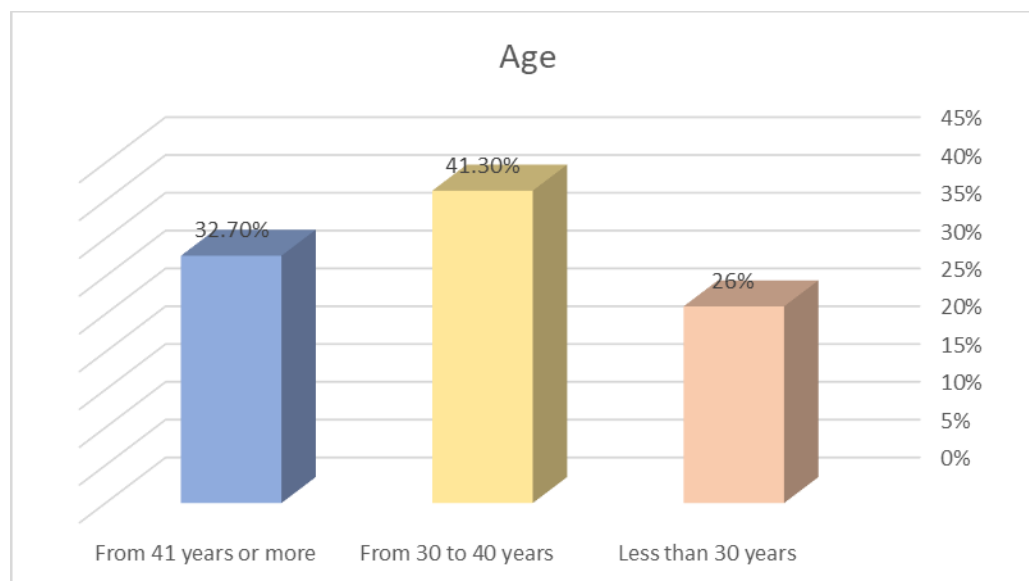


Chart (5) shows the distribution of the research sample individuals according to the Age variable.

From Table (7) and Chart (5), it is clear that 62 of the research sample individuals their ages ranged from 30 to 40 years by 41.3%, followed by 49 from the research sample individuals their ages were from 41 years or more by 32.7%, and finally 39 from the research sample individuals their ages were Less than 30 years by 26%.

Employment:

Table (8) and Chart (6) show the distribution of the research sample individuals according to the Employment variable

Table (8) Distribution of the research sample individuals according to the Employment variable

Employment	Number	Percentage
Employed	101	67.3%
Unemployed	49	32.7%
Sum	150	100%

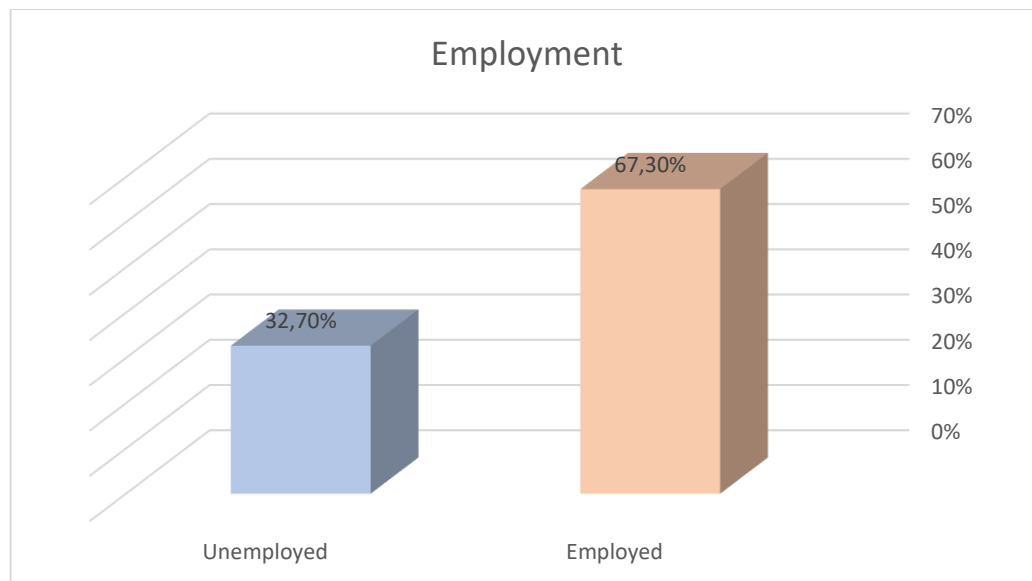


Chart (6) shows the distribution of the research sample individuals according to the Employment variable

From Table (8) and Chart (6), it is clear that 101 of the research sample individuals are Employed by 67.3%, while 49 from the research sample individuals are Unemployed by 32.7%.

Monthly income:

Table (9) and Chart (7) show the distribution of the research sample individuals according to the Monthly income variable

Table (9) Distribution of the research sample individuals according to the Monthly income variable

Monthly income (Saudi Arabian Riyal) SAR	Number	Percentage
Less than 5000	35	23.3%
From 5000 to 10000	71	47.3%
Over 10000	44	29.3%
Sum	150	100%

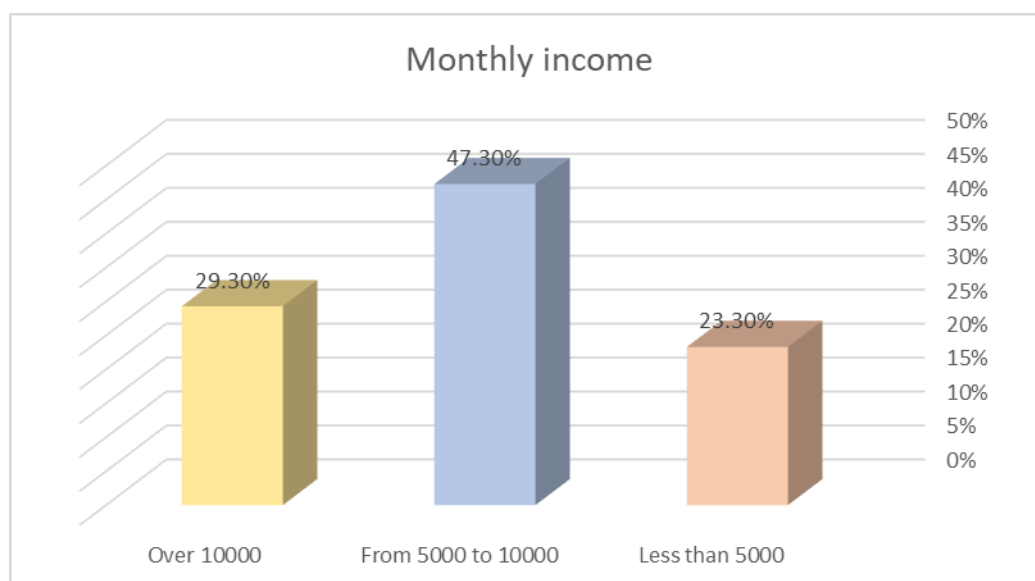


Chart (7) shows the distribution of the research sample individuals according to the Monthly income variable

From Table (9) and Chart (7), it is clear that 71 of the research sample individuals their Monthly income ranged from 5000 to 10000 SAR by 47.3%, followed by 44 of the research sample individuals their Monthly income was Over 10000 SAR by 29.3%, and finally 35 from the research sample individuals their Monthly income was Less than 5000 SAR by 23.3%.

Medical diagnosis:

Table (10) and Chart (8) show the distribution of the research sample individuals according to the medical diagnosis variable

Table (10) Distribution of the research sample individuals according to the medical diagnosis variable

Medical diagnosis	Number	Percentage
Diseases free	31	20.7%
Diabetes	13	8.7%
Hypertension	39	26%
Cardiovascular	23	15.3%
Liver diseases	9	6%
Cancer	6	4%
Asthma	15	10%
Thyroid	4	2.7%
Iron deficiency (anemia)	10	6.6%
Sum	150	100%

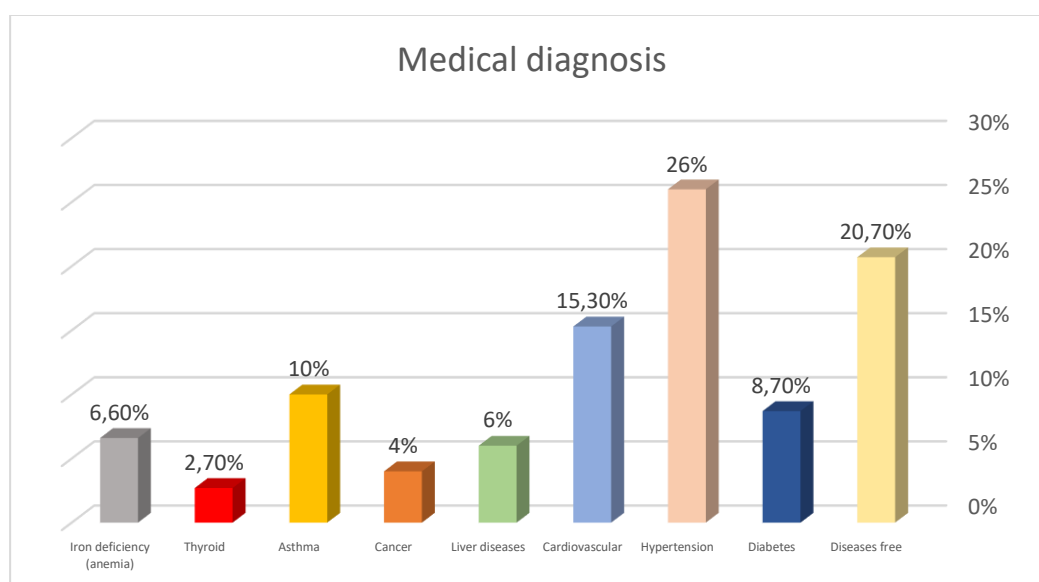


Chart (8) shows the distribution of the research sample individuals according to the Medical diagnosis variable

From Table (10) and Chart (8), it is clear that 39 of the research sample individuals their Medical diagnosis was Hypertension by 26%, followed by 31 of the research sample individuals their Medical diagnosis was Diseases free by 20.7%, followed by 23 from the research sample individuals their Medical diagnosis was Cardiovascular by 15.3%, followed by 15 from the research sample individuals their Medical diagnosis was Asthma by 10%, followed by 13 from the research sample individuals their Medical diagnosis was Diabetes by 8.7%, followed by 10 from the research sample individuals their Medical diagnosis was Iron deficiency (anemia) by 6.6%, followed by 9 from the research sample individuals their Medical diagnosis was Liver diseases by 6%, followed by 6 from the research sample individuals their Medical diagnosis was Cancer by 4%, and finally 4 from the research sample individuals their Medical diagnosis was Thyroid by 2.7%.

Food allergy:

Table (11) and Chart (9) show the distribution of the research sample individuals according to the Food allergy variable

Table (11) Distribution of the research sample individuals according to the Food allergy variable

Food allergy	Number	Percentage
Yes	93	62%
No	57	38%
Sum	150	100%

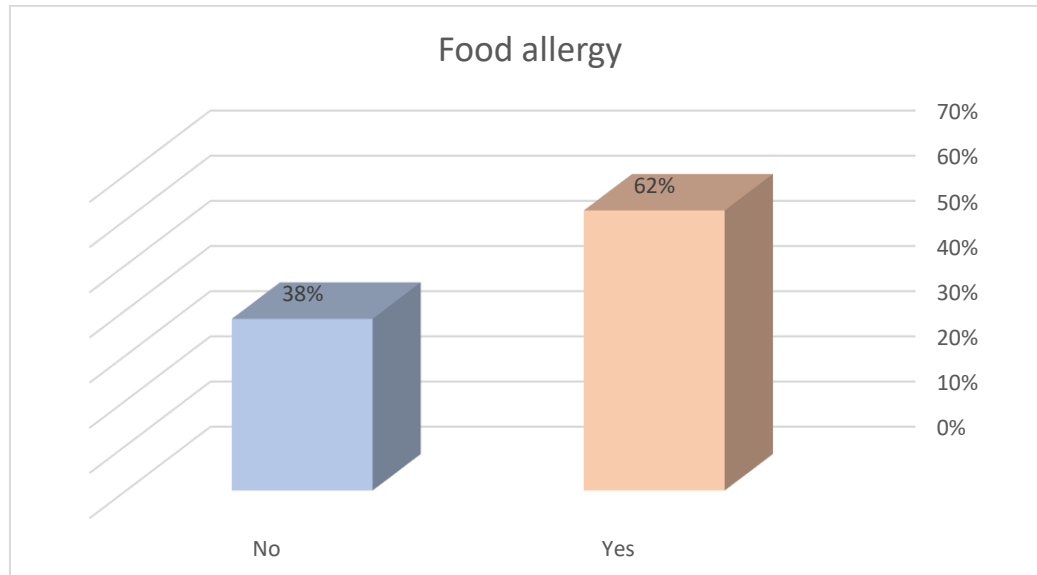


Chart (9) shows the distribution of the research sample individuals according to the Food allergy variable

From Table (11) and Chart (9), it is clear that 93 of the research sample individuals their Food allergy was Yes by 62%, followed by 57 of the research sample individuals their Food allergy was No by 38%.

Usage of the information of food labels

10- Are you aware that packaged foods have labels?

Table (12) and Chart (10) show the distribution of the research sample individuals according to (Are you aware that packaged foods have labels)

Table (12) Distribution of the research sample individuals according to (Are you aware that packaged foods have labels)

Are you aware that packaged foods has labels	Number	Percentage
Yes	106	70.7%
No	44	29.3%
Sum	150	100%

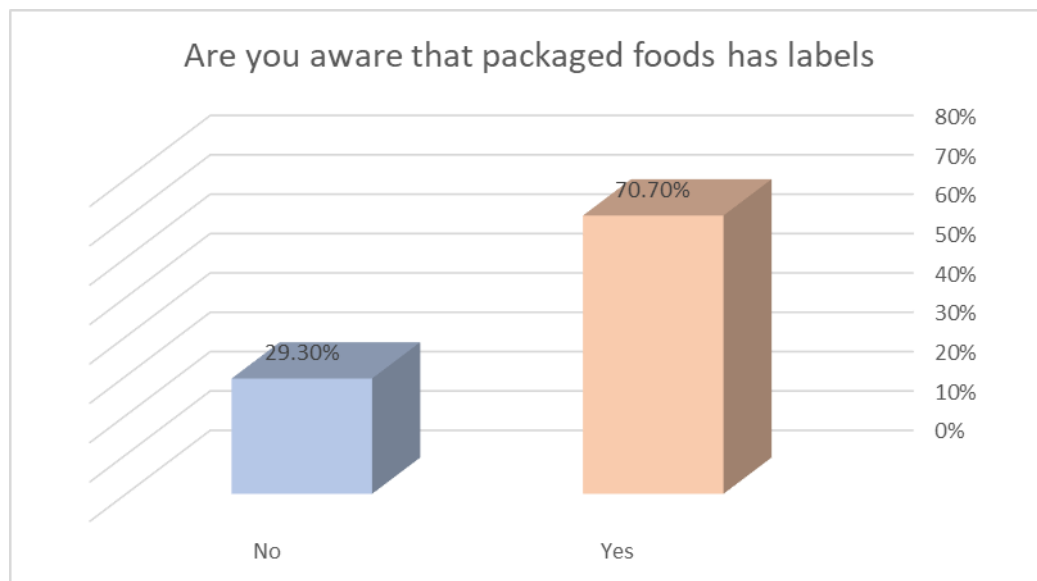


Chart (10) shows the distribution of the research sample individuals according to (Are you aware that packaged foods have labels)

From Table (12) and Chart (10), it is clear that 106 of the research sample individuals with regard to (Are you aware that packaged foods has labels) their answer was Yes by 70.7%, followed by 44 from the research sample individuals with regard to (Are you aware that packaged foods has labels) their answer was No by 29.3%.

How often do you read food labels?

Table (13) and Chart (11) show the distribution of the research sample individuals according to (How often do you read food labels)

Table (13) Distribution of the research sample individuals according to (How often do you read food labels)

How often do you read food labels	Number	Percentage
Always	75	50%
Sometimes	46	30.7%
Never	29	19.3%
Sum	150	100%

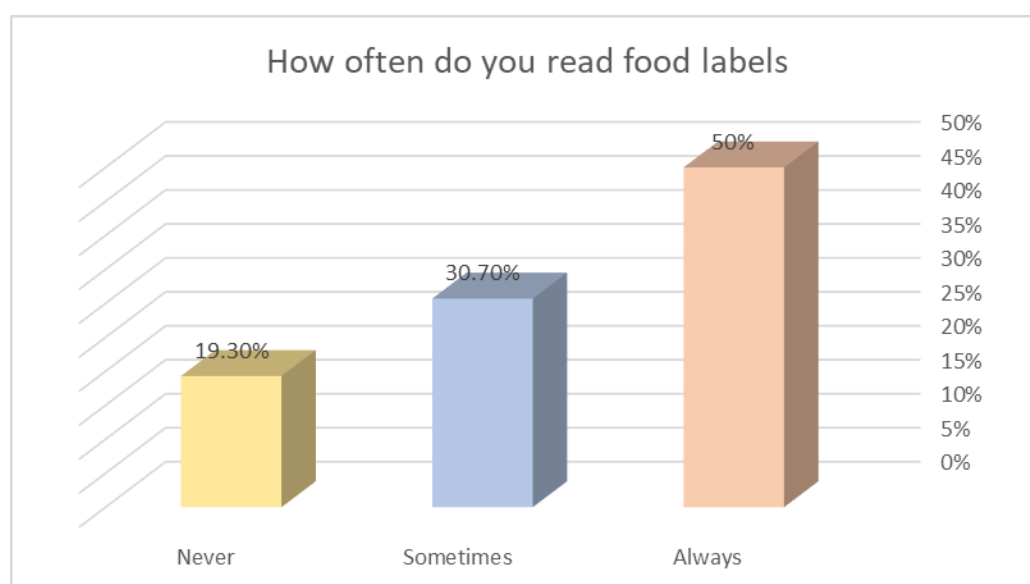


Chart (11) shows the distribution of the research sample individuals according to (How often do you read food labels)

From Table (13) and Chart (11), it is clear that 75 of the research sample individuals with regard to (How often do you read food labels) their answer was Always by 50%, followed by 46 of the research sample individuals with regard to (How often do you read food labels) their answer was Sometimes by 30.7%, and finally 29 from the research sample individuals with regard to (How often do you read food labels) their answer was Never by 19.3%.

Do you consider labels when buying packaged foods?

Table (14) and Chart (12) show the distribution of the research sample individuals according to (Do you consider labels when buying packaged foods)

Table (14) Distribution of the research sample individuals according to (Do you consider labels when buying packaged foods)

Do you consider labels when buying packaged foods	Number	Percentage
Yes	122	81.3%
No	28	18.7%
Sum	150	100%

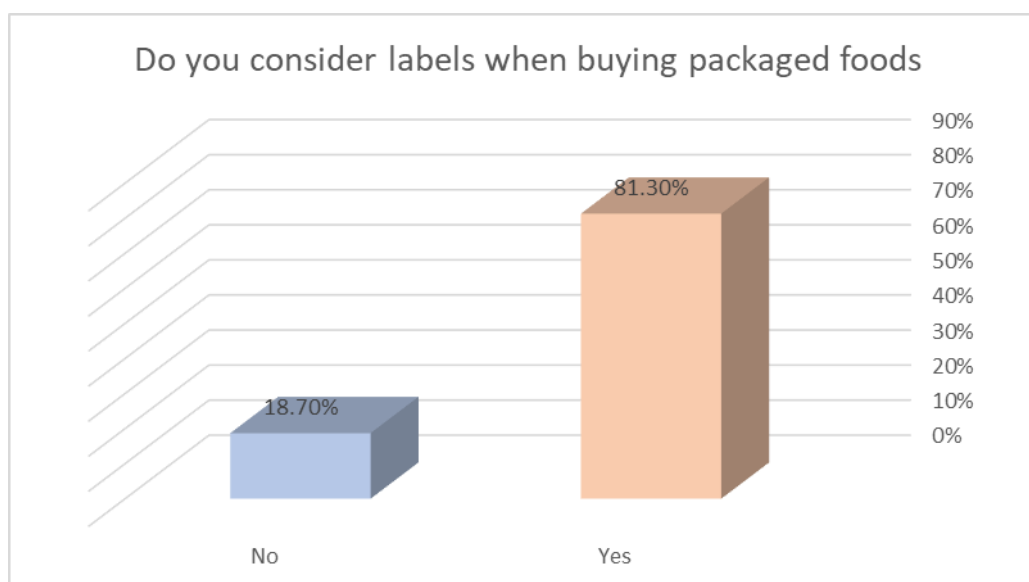


Chart (12) shows the distribution of the research sample individuals according to (Do you consider labels when buying packaged foods)

From Table (14) and Chart (12), it is clear that 122 of the research sample individuals with regard to (Do you consider labels when buying packaged foods) their answer was Yes by 81.3%, followed by 28 from the research sample individuals with regard to (Do you consider labels when buying packaged foods) their answer was No by 18.7%.

Are labels helpful when purchasing foods:

Table (15) and Chart (13) show the distribution of the research sample individuals according to (Are labels helpful when purchasing foods)

Table (15) Distribution of the research sample individuals according to (Are labels helpful when purchasing foods)

Are labels helpful when purchasing foods	Number	Percentage
Yes	138	92%
No	12	8%
Sum	150	100%

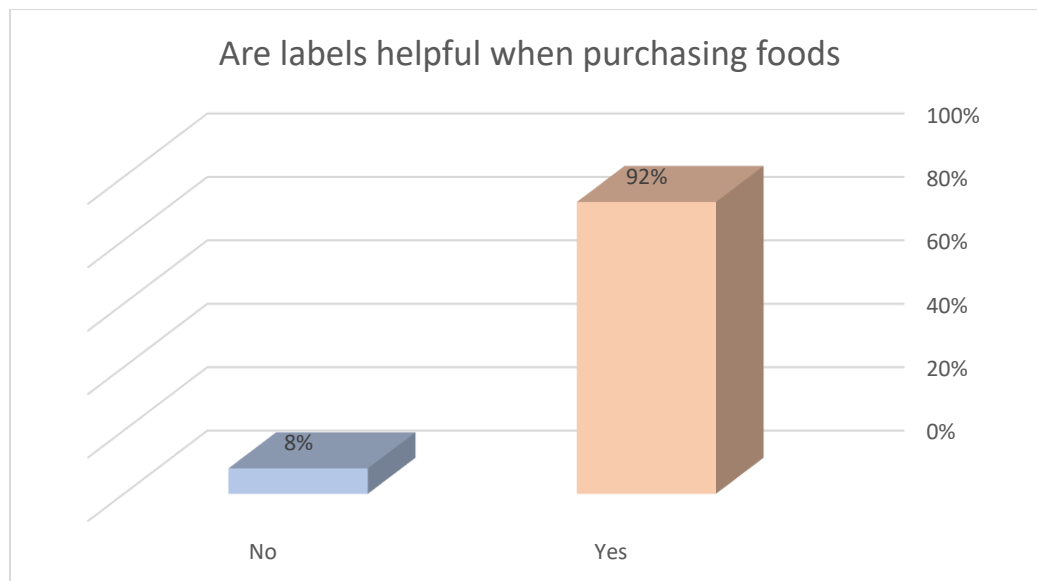


Chart (13) shows the distribution of the research sample individuals according to (Are labels helpful when purchasing foods)

From Table (15) and Chart (13), it is clear that 138 of the research sample individuals with regard to (Are labels helpful when purchasing foods) their answer was Yes by 92%, followed by 12 from the research sample individuals with regard to (Are labels helpful when purchasing foods) their answer was No by 8%.

3. Results and Discussion

The first hypothesis:

"There are statistically significant differences among the mean degrees of the sample individuals in the knowledge of food labels according to the study variables. To verify this hypothesis; the (T-test) was applied, and (ANOVA) was calculated for the degrees of the sample individuals in the knowledge of food labels, and the following tables show that:

Table (16) the differences in the mean of degrees of the sample individuals in the knowledge of food labels according to the Gender variable

Gender	Mean	Std. Deviation	N	df	t	Sig
Men	30.812	3.186	68	148	15.442	0.01
Women	18.301	1.779	82			

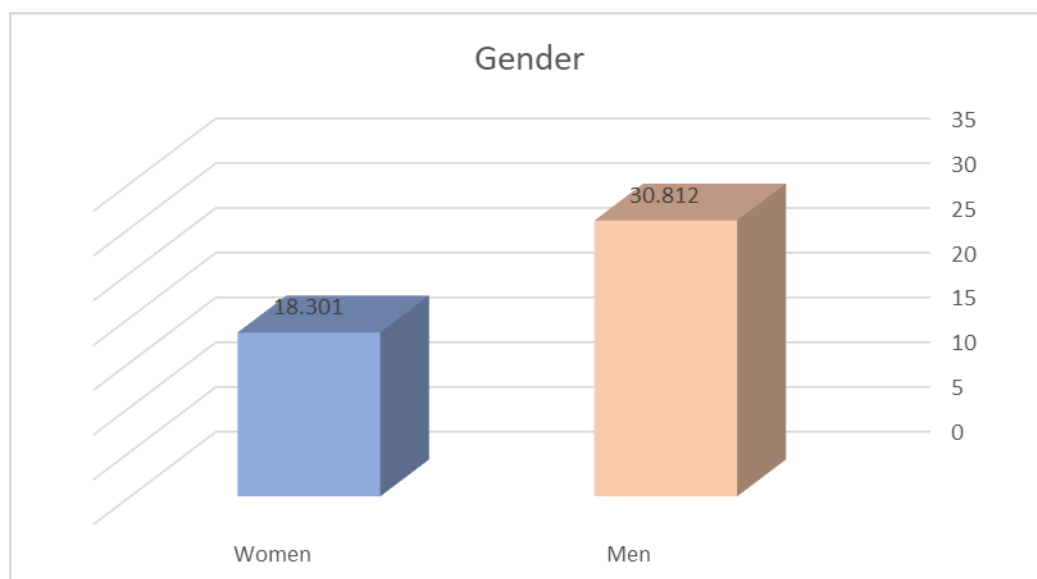


Chart (14) the differences in the mean of degrees of the sample individuals in the knowledge of food labels according to the Gender variable

From Table (16) and Chart (14), it is clear that: the value of (t) was (15.442), and it is a statistically significant at the level (0.01) in favor of Men, where the mean of Men's degree reached (30.812), while the mean of Women's degree reached (18.301). This indicates that Men were more aware of the knowledge of food labels than Women.

Table (17) the differences in the mean of degrees of the sample individuals in the knowledge of food labels according to the Nationality variable

Nationality	Mean	Std. Deviation	N	df	t	Sig
Saudi	25.446	2.514	91	148	2.318	0.05
Non-Saudi	23.021	2.009	59			

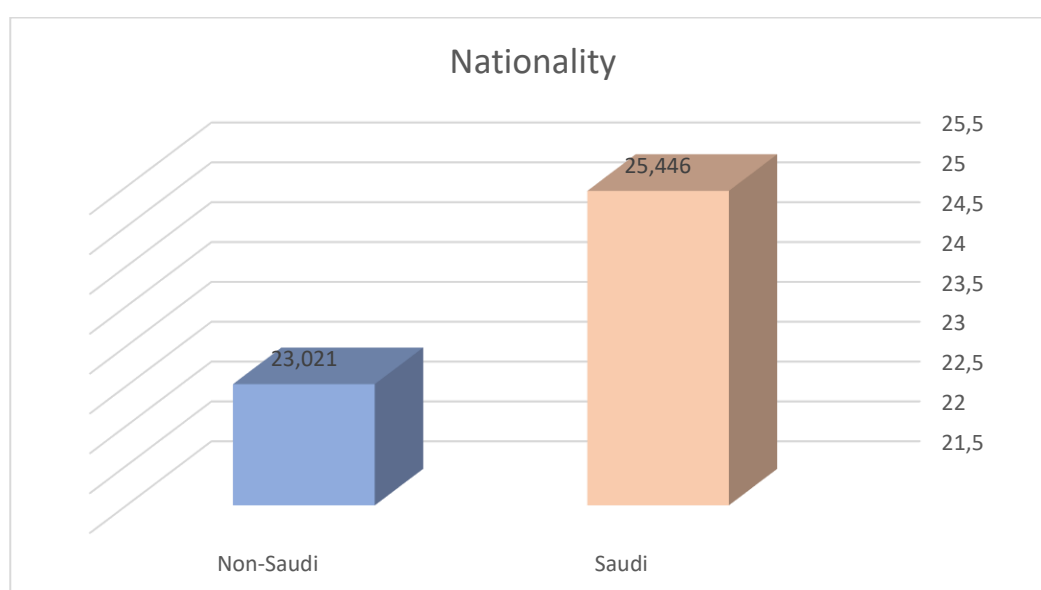


Chart (15) the differences in the mean of degrees of the sample individuals in the knowledge of food labels according to the Nationality variable

From Table (17) and Chart (15), it is clear that: the value of (t) was (2.318), and it is a statistically significant at the level (0.05) in favor of Saudi, where the mean of Saudi's degree reached (25.446), while the mean of non-Saudi's degree reached (23.021). This indicates that Saudi were more aware of knowledge of food labels than non-Saudi.

Table (18) analysis of variance for the degrees of the sample individuals in the knowledge of food labels according to the Marital status variable

Marital status	Sum of Squares	Mean Square	df	F	Sig
Between Groups	3.825	1.913	2	1.152	0.319
Within Groups	244.020	1.660	147		Not significant
Total	247.845		149		

It is clear from Table (18) that: the value of (F) was (1.152), and it isn't a statistically significant value, which indicates that no existence of differences among the degrees of the sample individuals in the knowledge of food labels according to the Marital status variable.

Table (19) analysis of variance for the degrees of the sample individuals in the knowledge of food labels according to the Education variable

Education	Sum of Squares	Mean Square	df	F	Sig
Between Groups	9222.039	4611.020	2	62.364	0.01
Within Groups	10868.749	73.937	147		
Total	20090.788		149		

It is clear from Table (19) that: the value of (F) was (62.364), and it is a statistically significant value at the level of (0.01), which indicates that there are differences among the degrees of the sample individuals in the knowledge of food labels according to the Education variable, and to know the direction of the significance, a Scheffe's test for the multiple comparisons was applied, and the following table shows this:

Table (20) Scheffe's test for the multiple comparisons

Education	High School or Diploma M = 16.031	Bachelor M = 23.467	Masters / PhD M = 30.551
High School or Diploma	-		
Bachelor	7.436**	-	
Masters / PhD	14.520**	7.084**	-

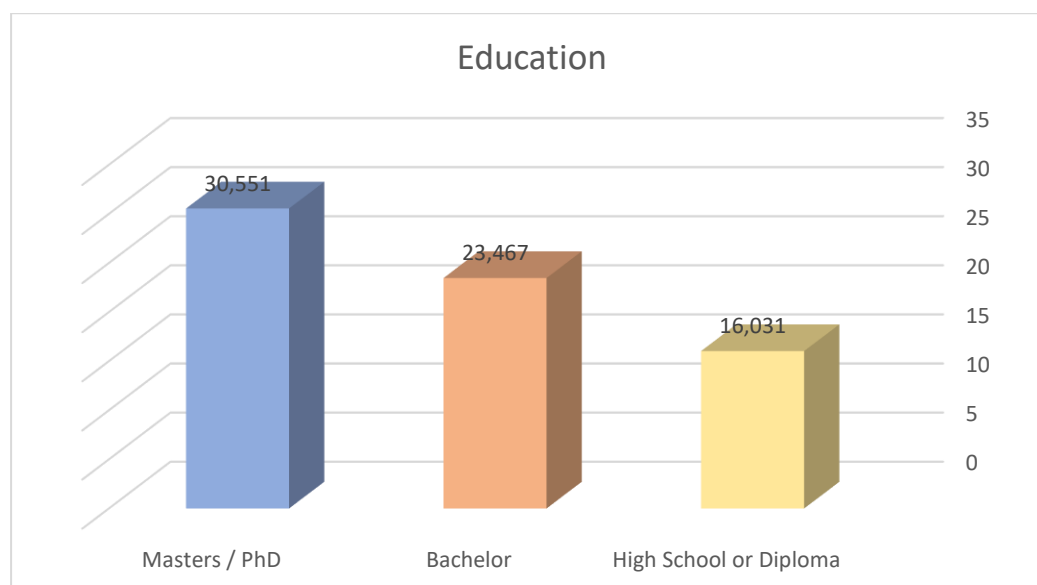


Chart (16) the differences of degrees of the sample individuals in the knowledge of food labels according to the Education variable

From Table (20) and Chart (16), it is clear that there are differences in the knowledge of food labels among the sample individuals who have Masters / PhD and both of the sample individuals who have Bachelor and the sample individuals who have High School or Diploma in favor of the sample individuals who have Masters / PhD at the significance level of (0.01). Also, there are differences among the sample individuals who have Bachelor and the sample individuals who have High School or Diploma in favor of the sample individuals who have Bachelor at the significance level of (0.01), where the mean degree of the sample individuals who have Masters / PhD reached (30.551), followed by the sample individuals who have Bachelor by mean of (23.467), followed by the sample individuals who have High School or Diploma by mean of (16.031). So, the sample individuals who have Masters / PhD come in the first rank, where they were more aware of the knowledge of food labels, then the sample individuals who have Bachelor, then the sample individuals who have High School or Diploma in the last rank.

Table (21) analysis of variance for the degrees of the sample individuals in the knowledge of food labels according to the Age variable

Age	Sum of Squares	Mean Square	df	F	Sig
Between Groups	8942.539	4471.269	2	45.089	0.01
Within Groups	14577.313	99.165	147		
Total	23519.852		149		

It is clear from Table (21) that: the value of (F) was (45.089), and it is a statistically significant value at the level of (0.01), which indicates that there are differences among the degrees of the sample individuals in the knowledge of food labels according to the Age variable, and to know the direction of the significance, a Scheffe's test for the multiple comparisons was applied, and the following table shows this:

Table (22) Scheffe's test for the multiple comparisons

Age	Less than 30 years M = 12.372	From 30 to 40 years M = 20.419	From 41 years or more M = 28.510
Less than 30 years	-		
From 30 to 40 years	8.047**	-	
From 41 years or more	16.138**	8.091**	-

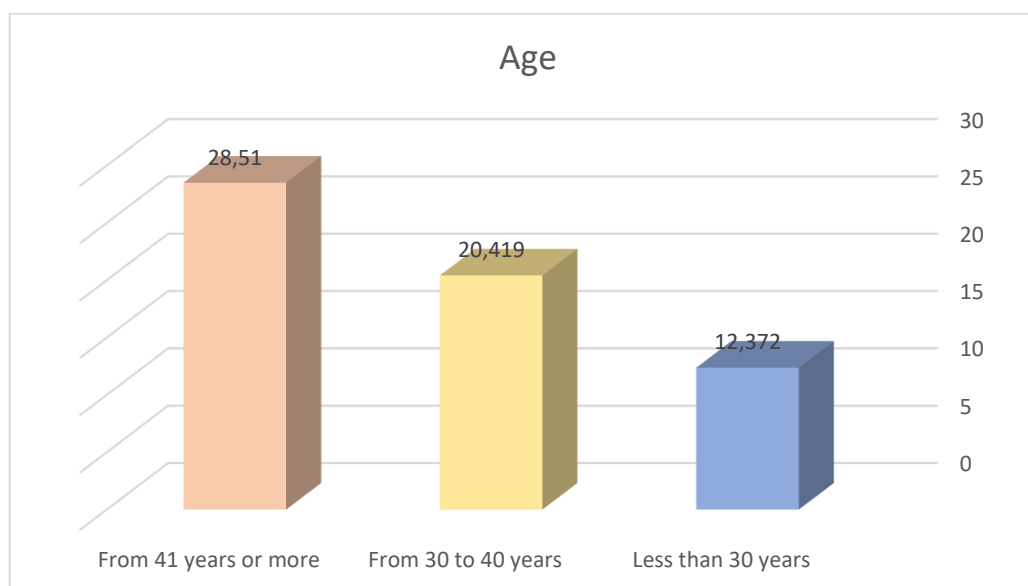


Chart (17) the differences of degrees of the sample individuals in the knowledge of food labels according to the Age variable

From Table (22) and Chart (17), it is clear that there are differences in the knowledge of food labels among the sample individuals ages are from 41 years or more, and both the sample individuals ages are (From 30 to 40 years + less than 30 years) in favor of the sample individuals who their ages From 41 years or more at the significance level of (0.01). Also, there are differences between the sample individuals who their ages are From 30 to 40 years and the sample individuals whose ages Less than 30 years in favor of the sample individuals who their ages are From 30 to 40 years at the significance level of (0.01), where the mean degree of the sample individuals who their ages are From 41 years or more reached (28.510), followed by the sample individuals who their ages are From 30 to 40 years by mean of (20.419), followed by the sample individuals who their ages are Less than 30 years by mean of (12.372). So, the sample individuals aged are from 41 years or more came in the first rank, where they were more aware of the knowledge of food labels, then the sample individuals aged are from 30 to 40 years came in the second rank, and in the last rank the sample individuals who their ages are less than 30 years.

Table (23) the differences in the mean of degrees of the sample individuals in the knowledge of food labels according to the Employment variable

Employment	Mean	Std. Deviation	N	df	t	Sig
Employed	31.403	3.881	101	148	18.395	0.01
Unemployed	17.517	2.235	49			

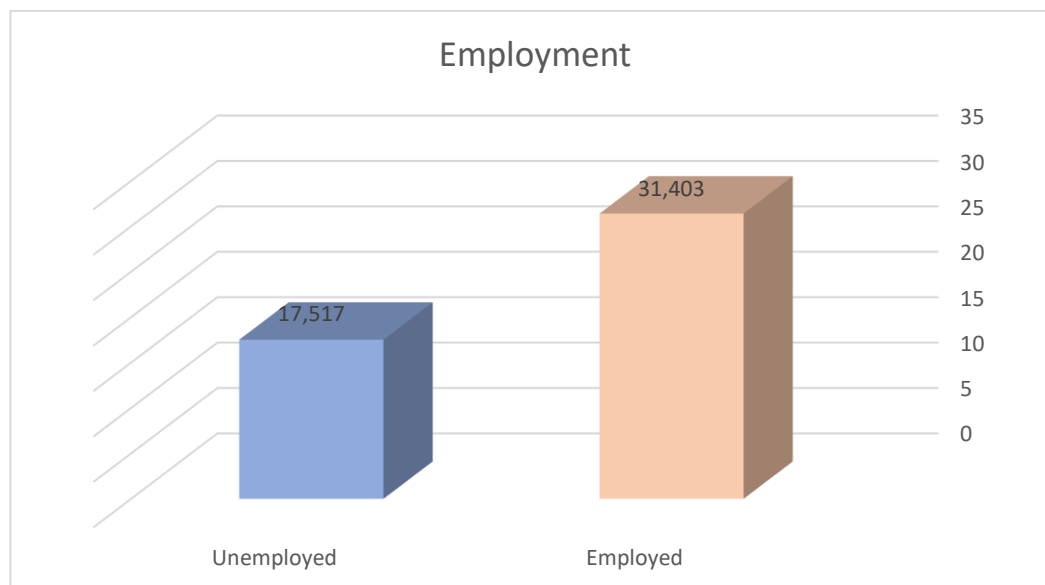


Chart (18) the differences in the mean of degrees of the sample individuals in the knowledge of food labels according to the Employment variable

From Table (23) and Chart (18), it is clear that: the value of (t) was (18.395), and it is a statistically significant at the level (0.01) in favor of Employed, where the mean degree of Employed reached (31.403), while the mean degree of Unemployed reached (17.517). This indicates that the Employed knew more about food labels than the Unemployed.

Table (24) analysis of variance for the degrees of the sample individuals in the knowledge of food labels according to the Monthly income variable

Monthly income	Sum of Squares	Mean Square	df	F	Sig
Between Groups	8639.786	4319.893	2	32.889	0.01
Within Groups	19308.069	131.347	147		
Total	27947.855		149		

It is clear from Table (24) that: the value of (F) was (32.889), and it is a statistically significant value at the level of (0.01), which indicates that there are differences among the degrees of the sample individuals in the knowledge of food labels according to the Monthly income variable, and to know the direction of the significance, a Scheffe's test for the multiple comparisons was applied, and the following table shows this:

Table (25) Scheffe's test for the multiple comparisons

Monthly income	Less than 5000 M = 17.530	From 5000 to 10000 M = 19.801	Over 10000 M = 30.192
Less than 5000	-		
From 5000 to 10000	2.271*	-	
Over 10000	12.662**	10.391**	-

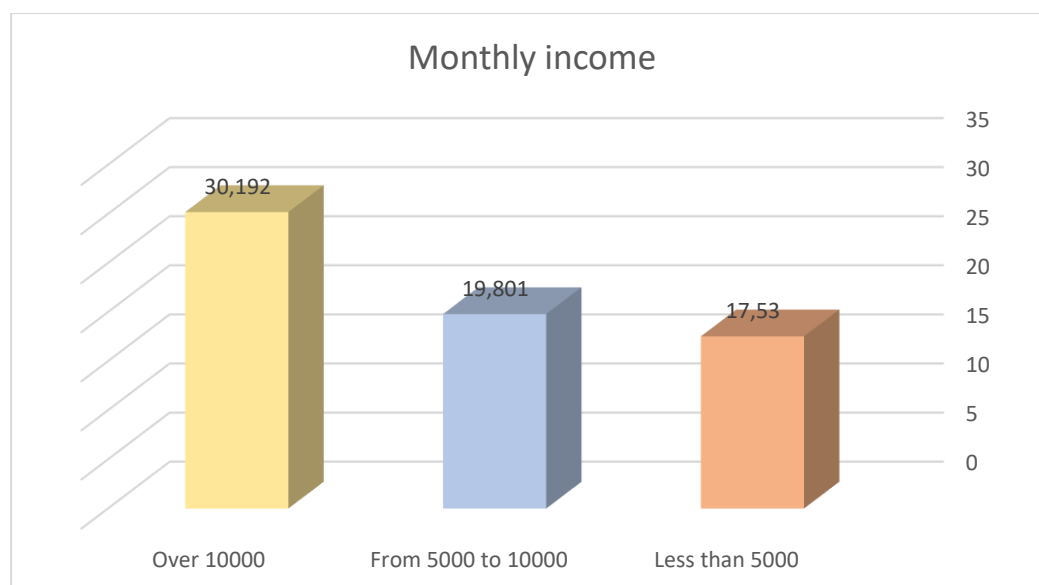


Chart (19) the differences of degrees of the sample individuals in the knowledge of food labels according to the Monthly income variable

From Table (25) and Chart (19), it is clear that there are differences in knowledge of food labels among the sample individuals who their income is over 10000, and both the sample individuals who their income is (from 5000 to 10000 + less than 5000) in favor of the sample individuals who their income is over 10000 at the significance level of (0.01), while there are differences among the sample individuals who their income is from 5000 to 10000 and the sample individuals who their income is less than 5000 in favor of the sample individuals who their income is from 5000 to 10000 at the significance level of (0.05), where the mean degree of the sample individuals whom their income is over 10000 reached (30.192), followed by the sample individuals who their income is from 5000 to 10000 by mean of (19.801), and finally the sample individuals who their income is less than 5000 by mean of (17.530). So, the sample individuals who their income is over 10000 come in the first rank, where they were more aware of the knowledge of food labels, then the sample individuals who their income is from 5000 to 10000 come in the second rank, and in the last rank the sample individuals who their income is less than 5000.

From Table (10) and Chart (8) the data illustrated that the participants reported diseases free (20.7%), while the rest of the participants had diseases including Hypertension, Cardiovascular, Asthma, Diabetes, Iron deficiency (anemia), Liver diseases, Cancer and Thyroid with the percentage of 26, 15.3, 10.8.7, 6.6, 6, 4 and 2.7 %, respectively. It is clear from Table (11) and Chart (9) that most participants answered Yes when asked if they had food allergies (62%), while 38% of the total participants answered No.

The second hypothesis:

There is a correlation relation between the knowledge of food labels and the variables of the study. To verify the validity of this hypothesis, a correlation matrix was created between the knowledge of food labels and the variables of the study, and the following table shows the values of the correlation coefficients:

Table (26) the correlation matrix between knowledge of food labels and the variables of the study

	knowledge of food labels
Gender	0.169
Nationality	0.108
Marital status	0.227
Education	**0.958
Age	**0.779
Employment	*0.612
Monthly income	**0.834

** significant at 0.01 *significant at 0.05 without stars not significant

From Table (26) it is clear that there is a direct correlation relation between the knowledge of food labels and some of the study variables at the significance level of 0.01, and 0.05. So, if the education gets higher, the awareness of knowledge of food labels will increase. Also, if the age gets higher, the awareness of knowledge of food labels increases, also if the Employment gets higher, the awareness of knowledge of food labels increases, also, if the Monthly income gets higher, the awareness of knowledge of food labels gets increased, while there is no correlation between Gender and the awareness of knowledge of food labels. Also, there is no correlation between Nationality and the awareness of knowledge of food labels. As well as there is no correlation between Marital Status and the awareness of knowledge of food labels.

The third hypothesis:

The participation percentage of the factors affecting the knowledge of food labels varies.

To verify this hypothesis, the relative importance was calculated using the regression coefficient (the graded step forward) for the factors affecting the knowledge of food labels, and the following table shows that:

Table (27) the relative importance using the regression coefficient (Regression Stepwise) of the factors affecting the knowledge of food labels

Dependent variable	Independent variable	R	R Square	F	Sig	Beta	t	Sig
knowledge of food labels	Education	0.913	0.833	139.890	0.01	0.716	11.828	0.01
	Employment	0.878	0.770	93.936	0.01	0.635	9.692	0.01
	Age	0.839	0.704	66.603	0.01	0.554	8.161	0.01
	Gender	0.787	0.619	45.429	0.01	0.457	6.740	0.01

From the previous table, it is clear that Education was one of the most influential factors in the knowledge of food labels at 83.3%, followed by Employment at 77%, and followed by the Age at 70.4%, and in the last rank the Gender at 61.9%.

According to our survey, most of the respondents had a good attitude toward packaged foods having labels and they always read food labels before purchasing a food product, they also consider labels when buying packaged foods which means that customers are aware of food labels and go to great lengths to find nutritional information and comprehend it and this confirms what was in the previous finding (Adesina et al., 2022). In addition, 92% of the survey's individuals answered yes when they were asked if are labels helpful when purchasing foods. However, only 8% of respondents answered No which confirms the previous finding (Turkistani and Saaty, 2020).

4. Conclusion:

Our study assessed the knowledge of the consumers and their use of nutritional facts on food labels for Saudi and non-Saudi pilgrims during Umrah period, most of the research sample individuals were Women at a rate of 54.7%, while 45.3% were Men, which shows that women were keener to know about nutritional facts on food labels. It also shows that 60.7% of the research sample individuals were Saudi, while 39.3% were non-Saudi. According to the results Married individuals were more aware of nutritional facts on food labels followed by Divorced, Single, and Widowed at the rate of 48.7, 24, 16, and 11.3% respectively. In addition, educated individuals with a Bachelor's degree were more aware of nutritional facts on food labels than a High School or Master / Ph.D. It is clear that 62 of the research sample individuals their aged between 30 to 40 years followed by 49 aged 41 years or more and 39 of the research sample individuals aged less than 30 years. It is clear that 67.3% of the research sample individuals were Employed, while 32.7% were Unemployed. Individuals with Monthly income ranging from 5000 to 10000 SAR rated at 47.3% followed by 29.3% for individuals whose Monthly income was over 10000 SAR.

Based on the Medical diagnosis, our results display that, most of the research sample individuals were Hypertension which counted 39 of the total individuals followed by Diseases free, Cardiovascular, Asthma, Diabetes, Iron deficiency (anemia), Liver diseases, Cancer, and Thyroid respectively. The majority of the individuals were allergic to food at about 62% while 38%.

Moreover, 70.7% of the research sample individuals were aware that packaged foods have labels, and 50% of them were always reading food labels followed by 30.7% Sometimes reading and 19.3% they are never reading. 92% of the research sample individuals believed labels were helpful when purchasing.

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