Determinants of Nutrition Label Use among Turkish Consumers

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Abstract

The purpose of this study is to examine the various factors that affect Turkish consumers' use of nutrition labels. Data was collected from a total of 500 consumers living in Istanbul through the use of a structured and undisguised questionnaire. Unlike previous research, hypotheses regarding 'gender', 'marital status', 'preschool child ownership', 'working status', 'time pressure', 'nutrition knowledge', 'importance given to price', and 'awareness of diet-disease relation' all yielded insignificant results. Again, contrary to most of the earlier studies, the direction of the relationship in case of 'age' and 'income' was negative rather than positive. It seems that different aspects of "concern about, interest in, and importance given to health and nutritious eating" are influential in nutrition label use in the Turkish market. Although the findings of the study pertain to the Turkish market, its implications may be applicable in other countries, as well, where nutrition labeling is not mandatory for the time being.

Keywords: Nutrition Labeling, Nutritional Label Use, Turkish Consumer

1. Introduction

According to the World Health Organization (WHO) 2008 global estimates, there were more than 1.5 billion overweight adults, at least 500 million of whom were obese (WHO, 2011b). Besides, the WHO predicts there will be 2.3 billion overweight adults in the world by 2015 and more than 700 million of them will be obese (www.h4hinitiative.com, 2011). The spread of obesity among children is also quite dramatic; today, there are about 45 million overweight children under five years of age in the world (WHO, 2011b).

Even though there are different causes of obesity such as genetics, psychological factors, illnesses, and medication; lifestyle habits, inclusive of poor diet and low levels of daily activity, seem to play a major role in this respect (Hutcher, 2011).

Clearly, one way to fight against obesity is to increase public awareness with respect to the detrimental consequences (such as high blood pressure, type 2 diabetes, heart disease, stroke, gallbladder disease, cataracts, age-related macular degeneration and cancer of the breast, prostate, and colon, asthma, pregnancy complications, infertility and even Parkinson's disease) (Hutcher, 2011) of this health related epidemic and educate individuals so as to be able to deal with this threat, at least in case of the above mentioned lifestyle habits. One of the obvious ways to maintain a balanced weight, of course, is to be able to burn more calories than consume. Individuals may limit their energy intake from total fats, increase consumption of fruits, vegetables, legumes, whole grains, and nuts, limit the intake of sugars, and engage in regular physical activity so as to prevent obesity (WHO, 2011a). In turn, choice of healthier foods may be accomplished through the use of nutrition labels, one of the major instruments in helping people make better food purchase decisions and adopt healthier eating patterns (Nayga, 1996; Drichoutis et al., 2006; Grunert & Wills, 2007; Mhurchu & Gorton, 2007; Feunekes et al., 2008; Nørgaard & Brunsø, 2009).

This study is an attempt to analyze the determinants of nutritional label use among Turkish consumers and shed some light on this rather less-researched topic in Turkey while making some recommendations to the public, the food industry, and the state, together with further research, regarding this issue.

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2. Literature Review

As Drichoutis et al. (2006) point out, studies on the determinants of nutritional label use have found that individual characteristics (gender, age, education), situational, behavioral and attitudinal factors (income, working status, available time for grocery shopping, health status and awareness, concern about nutrition and health, type of household), product involvement factors (first time purchases, importance given to price, importance given to nutrition, importance given to taste), nutrition knowledge, motivation, and some other factors (use of claims, skepticism toward claims, attitude toward nutrition) are all influential in consumers' use of nutrition labels. However, results of such studies have not yielded consistent results, especially in case of age, income, working status, and household size.

A number of studies have shown that females seem to be more likely to use nutritional labels compared to males (Guthrie et al, 1995; Nayga, 1996; Govindasamy & Italia, 1999; Marietta et al. 1999; Neuhouser et al., 1999; Kim et al. 2001a, 2001b; McLean-Meyinsse, 2001; Cowburn & Stockley , 2005; Satia et al., 2005; Grunert & Wills, 2007; Misra, 2007).

As mentioned above, with respect to age, results of studies have not been consistent with each other. In some studies, as age increased, the probability of using nutritional labels decreased (Kim et al., 2001a, 2001b) while the exact opposite was found to be true in some other studies (Govindasamy & Italia, 1999; Neuhouser et al., 1999; Drichoutis, et al., 2005; Satia et al., 2005; Misra, 2007). Besides, the label reading habits of older people were found to be unclear in Cowburn & Stockley's (2005) study. Effects of age on label use might, as well, be insignificant (Nayga, 2000).

As for education, higher educated individuals were more likely to use nutritional labels (Feick et al.,1986; Guthrie et al, 1995; Nayga 1996; Nayga et al., 1998; Neuhouser et al., 1999; Kim et al., 2001a; McLean-Meyinsse, 2001; Cowburn & Stockley (2005); Drichoutis et al 2005; Satia et al., 2005; Grunert & Wills, 2007; Bozkır, 2009). Nevertheless, in the Nayga study (2000), education did not have significant effects on the use of labels. Contradictory results exist in case of household size, as well. Larger households were more likely to use nutritional labels, in general, in Nayga (1996) study whereas it was found to be negatively related to nutritional label use in Drichoutis et al. (2005), Govindasamy & Italia (1999), and Guthrie et al.(1995) studies. Households with preschool children & married consumers were more likely to use nutritional labels (Feick et al., 1986, McLean-Meyinsse, 2001).

According to various studies, people with more available time for grocery shopping were more likely to use nutritional labels (Feick et al., 1986; Nayga et al., 1998) and time pressure limited individuals' use of nutritional labels (Grunert & Wills, 2007). Those who agreed with the statement "reading labels takes more time than I can spend", implying time pressure, were also found to be less likely to use nutrition labels in different studies (Kim et al., 2001a; Lin & Lee, 2003).

In most studies, income, working status, and time spent grocery shopping have been used as proxies of time pressure in information search behavior (Drichoutis et al, 2005): Income level was found to positively affect label use in a number of studies (Kim et al., 2001a; McLean-Meyinsse, 2001; Cowburn & Stockley, 2005) while a negative effect was found in some other studies (Drichoutis et al., 2005). The same is true in case of employment: In Drichoutis et al.'s study (2005), employment affects label use positively whereas a negative effect was found in Nayga et al. (1998) and Nayga (2000) studies, meaning, unemployed consumers are more likely to use nutritional labels. Time spent grocery shopping, on the other hand, was found to affect label usage positively (Nayga et al, 1998).

First time purchase of a product also increased likelihood of nutritional label use (Grunert & Wills, 2007).
Consumers placing importance on price are less likely to use nutritional labels in general (Nayga et al., 1998; Drichoutis et al, 2005; Nayga, 2005; Grunert & Wills, 2007). Effect of importance of taste on nutrition label use was not clear (Nayga 1996, 1999, 2000; Nayga et al., 1998; Drichoutis et al, 2005). Nevertheless, as Grunert & Wills (2007) pointed out, there might be a trade-off between health and nutrition on one side and price and/or taste on the other, and some people preferred taste and/or price to health and nutrition.

A positive relation between label use and nutrition knowledge was found in a number of studies (Guthrie et al 1995; Szykman et al., 1997; Neuhouser et al. 1999, Kim et al., 2001b; Drichoutis et al, 2005; Satia et al 2005; Misra, 2007) whereas Nayga (2000) reported that nutrition knowledge did not have an effect on label use.

According to Grunert et al. (2010 a), the degree of use of nutrition information depends on product category and usage is a question of interest in healthy eating. A positive link was also found between nutrition label use and healthy food choices in Barreiro-Hurlé et al.'s study (2010). In another study, Grunert et al (2010 b) pointed out that in addition to country-specific differences, use and understanding were also affected by differences in interest in nutrition knowledge and by social grade, as well as, by an interest in healthy eating.

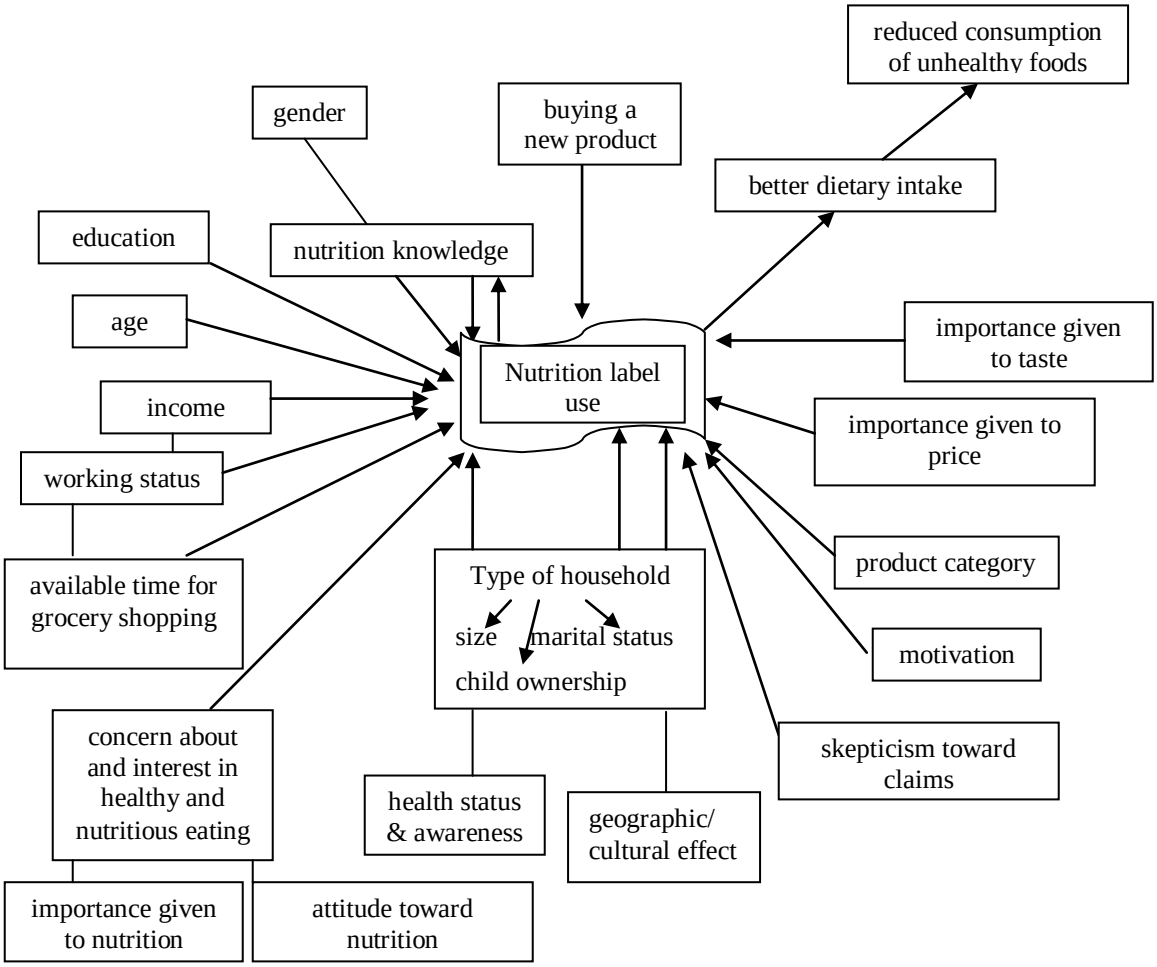
Those aware of the diet-health/diet-disease relation (Feick et al, 1986; Guthrie et al, 1995; Szykman et al., 1997; Nayga et al., 1998; Marietta et al., 1999; Nayga, 2000; Kim et al., 2001a; Drichoutis et al, 2005), consumers on a special diet (Bender & Derby, 1992; Drichoutis et al, 2005), those with a health problem that led to dietary restrictions (Bender & Derby, 1992; Nayga et al., 1998), people who were more concerned about nutrition and health (Guthrie et al., 1995; Nayga et al., 1998; Nayga 2000; Cowburn & Stockley, (2005), individuals who perceived the importance of a healthy diet (Bender and Derby, 1992; Guthrie et al. 1995; Szykman et al.,1997; Nayga et al.,1998; Neuhouser et al., 1999), and organic buyers (Govindasamy & Italia, 1999) were also found as being more likely to use nutrition labels. As such, according to Svederberg et al.'s study (2008), individuals' health motives predicted the use of information on food labels and purchase of healthy food products.

Some other factors have also been found to affect nutrition label use (Drichoutis et al., 2006); among these are health and nutrition claim use, being skeptical toward claims, and attitude consumers have toward nutritional content. Accordingly, in Szykman et al.'s (1997) study, use of nutrient claims had a negative effect on the use of health claims but a positive effect on the frequency of nutrient content use. Besides, being skeptical toward claims had a negative effect on use of health claims and a positive effect on nutritional label use. As has also been pointed out by the Drichoutis et al. (2006) study, perceived usefulness of nutritional information affected consumers' attitudes toward nutritional content in Feick et al.(1986) study.

As has been revealed in the Grunert & Wills (2007) study, "there seem(ed) to be a geographical/ cultural effect as well, roughly following a North-South distinction: Informants in the Nordic countries, in the Netherlands and in the UK were most interested, whereas informants in countries like France, Greece and Spain were not so enthusiastic about the prospects of receiving more nutrition information" (p.389).

Based on the foregoing review, the conceptual framework guiding this study is revealed in Figure 1, upon which hypotheses of the study have been formulated.

Figure 1: The Conceptual Framework Guiding the Study



3. Research Design and Methodology

3.1. Research Purpose and Design

The purpose of this study is to examine the various factors that affect Turkish consumers' use of nutrition labels. Based on the reviewed literature, hypotheses of this study are the following:

H1: Females are more likely than men to use nutrition labels.
H2: As age increases, probability of using nutrition labels increases.
H3: As income level increases, probability of using nutrition labels increases.
H4: Higher educated individuals are more likely to use nutrition labels.
H5a: Household size is negatively related to nutrition label use.
H5b: Households with preschool children are more likely to use nutrition labels.
H5c: Married consumers are more likely to use nutrition labels.
H6a: Unemployed consumers are more likely to use nutrition labels.
H6b: Time pressure limits individuals' use of nutrition labels.
H7: Nutrition knowledge has a positive impact on nutrition label use.
H8: Consumers who are more concerned about nutrition and health are more likely to use nutrition labels.
H9: Organic product purchasers are more likely to use nutrition labels.
H10: Consumers with a health concern necessitating careful choice of foods are more likely to use nutrition labels.
H11: Consumers on a (special) diet are more likely to use nutrition labels.
H12: First time purchase of a product increases likelihood of nutrition label use.
H13: Consumers placing importance on price are less likely to use nutrition labels in general.
H14: Consumers aware of the diet-disease relation are more likely to use nutrition labels.

3.2. Data Collection Procedure and Instrument

Data was collected through a structured and undisguised questionnaire distributed among consumers. Questions were developed upon a thorough analysis of relevant literature. A pilot study was carried out among 20 consumers to see if the questions were readily understood. Necessary changes were made in the wording of some questions before distributing the questionnaires for the actual study. The internal reliability of the questionnaire using the Cronbach's alpha coefficient was 0.92, which indicated a high internal correlation among the items. The content validity in meeting the objectives of the study was established on consultation with food engineers and the literature. The questionnaire was composed of different sections and took an average of 15 to 20 minutes to administer.

3.3. The Sampling Design

This cross-sectional field study took place during the two months of July and August, 2011. The sample consisted of 500 individuals and was recruited by a local market research company. All of the participants gave their informed consent prior to their inclusion in the study. These individuals were over 18 years of age, lived in the socio-economically different districts of Istanbul, and did food shopping for themselves and/or their families. Within this frame, high, middle, and low income districts on the Asian and European sides of the city were chosen and the questionnaires were administered face to face with the respondents at their homes, by qualified interviewers. Random sampling was used in recruiting the respondents and the sample size was determined taking into consideration population densities of the districts representative of Istanbul as a whole. To enable maximum reach during the data collection process, no more than ten interviews were conducted in each neighborhood and a maximum of three contacts were established on each street in apartments that were not next to each other. The field process was first controlled by supervisors in the region and later more than 50% of respondents were rechecked to see if they had really been surveyed.

3.4. Analysis of Data

The analysis on the 500 questionnaires, inclusive of the descriptive statistics and the relevant tests to investigate the various relationships and differences sought among the variables included in the study, was completed by using the computer program SPSS (Statistical Package for the Social Sciences). Since all of the variables used in the study were found to be non-normally distributed, non-parametric tests were used (Mann-Whitney, Kruskal-Wallis). The Mann-Whitney U Test was used to test for significant differences in case of "gender", "child ownership", "health-related concern ownership", "nutrition knowledge", "follow-up of nutrition related news in the media", "perceived ease in understanding nutrition labels", "perceived trustworthiness of nutrition claims on labels", and "health and nutrition related attitudes" while the Kruskal-Wallis Test was used in case of "age", "education", "income", "marital status", "working status", "size of household", "various conditions under which nutrition labels are read", "importance given to a healthy and nutritious diet", "perceived healthiness of one's eating habits", and "organic product purchase frequency".

4. Findings

Demographic characteristics of the respondents are presented in Table 1.

Table 1: Sample Characteristics

		Frequency	Valid %
Gender	Female	249	49.8
	Male	251	50.2
Age	18-24	115	23.0
	25-34	119	23.8
	35-44	113	22.6
	45-54	72	14.4
	55-64	60	12.0
	65 and above	21	4.2
Education	Literate	12	2.4
	Primary school	112	22.4
	Secondary school	65	13.0
	High school	199	39.8
	University	111	22.2
	Post graduate	1	0.2
Working status	Full-time	280	56.0
	Part-time	4	0.8
	Did not work	216	43.2
Income	0-500 TL	4	0.8
	501-1000 TL	57	11.4
	1001-1500 TL	101	20.2
	1501-2000 TL	100	20.0
	2001-3000 TL	102	20.4
	3001-5000 TL	66	13.2
	5000+ TL	15	3.0
	Did not reply	55	11.0
Marital status	Married	228	45.6
	Not married	232	46.4
	Divorced/widowed	40	8.0
Size of household	1	60	12.0
	2	62	12.4
	3	118	23.6
	4	136	27.2
	5 and more individuals	124	24.8
Presence of children younger than 5	none	423	84.6
	1	69	13.8
	2	7	1.4
	3	1	0.2
Presence of children aged 5-17	none	319	63.8
	1	113	22.6
	2	55	11.0
	3	8	1.6
	4 or more	5	1.0

Upon conducting the relevant Mann-Whitney U Tests and the Kruskal-Wallis Tests, the following results were obtained with respect to the hypothesized relationships. (Table2)

Table 2: Hypotheses Test Results

Hypothesis	Significance / Direction of the Relationship	Asymptotic Significance	Result	Revealed in Table
H1	insignificant	p>.05	not supported	--
H2	negative	p=.020	not supported	3, 3A
H3	negative	p=.047	not supported	4, 4A
H4	unclear	p=.037	partially supported	5, 5A
H5a	unclear	p=.032	not supported	6, 6A
H5b	insignificant	p>.05	not supported	--
H5c	insignificant	p>.05	not supported	--
H6a	insignificant	p>.05	not supported	--
H6b	insignificant	p>.05	not supported	--
H7	insignificant	p>.05	not supported	--
H8	positive	p<.05	supported	7, 8
H9	positive	p=.000	supported	9, 9A
H10	positive	p<.05	supported	10
H11	positive	p=.000	supported	11
H12	positive	p=.000	supported	11
H13	insignificant	p>.05	not supported	--
H14	insignificant	p>.05	not supported	--

H1-gender; H2-age; H3-income; H4-education; H5a-size of household; H5b-pre-school children; H5c-marital status; H6a-working status; H6b-time pressure;
H7-nutrition knowledge; H8-concern about nutrition and health; H9-organic product purchase; H10-health concern ownership; H11-being on a diet; H12-first time purchase;
H13-importance given to price; H14-awareness of diet-disease relationship

The hypotheses regarding 'gender', 'marital status', 'preschool child ownership', 'working status', 'time pressure', 'nutrition knowledge', 'importance given to price', and 'awareness of diet-disease relation' all yielded insignificant results (p > .05); hence they are rejected. The hypotheses regarding 'age' and 'income' (Tables 3, 3A, 4, and 4A) resulted in significant results; however, contrary to most of the earlier studies, the direction of the relationship was negative rather than positive. Those who are 55 and more years of age seem to use nutrition labels less compared to those who are in between 25 and 54 and those who have 'high levels of income' seem to use nutrition labels less, compared to those who have middle and low income levels.

Table 3: Kruskal-Wallis Test Results With Respect to 'Age'

Test Statistics		N		Mean Rank
		1	115	241.61
		2	119	256.80
Chi-square	13.446	3	113	271.09
df	5	4	72	271.16
Asymp.Sig.	.020	5	60	211.48
		6	21	193.33

1:18-24; 2:25-34; 3:35-44; 4:45-54; 5:55-64; 6:65 and above
1:Never; 2:Seldom; 3:Sometimes; 4:Usually; 5:Always (for nutrition label usage)

Table 3A: Mann Whitney U Test Results With Respect to Pair-wise Comparisons of the Relevant Age Groups

(Pair-wise comparisons among the different groups, completed using the Mann-Whitney U Test, yielded the following significant results)

Statement	Test Statistics		N	Mean Rank
*2 & 5	Mann-Whitney U	2916.000	2 119	95.50
	Asymp. Sig.(2 tailed)	.033	5 60	79.10
2 & 6	Mann-Whitney U	928.500	2 119	73.20
	Asymp. Sig.(2 tailed)	.046	6 21	55.21
3 & 5	Mann-Whitney U	2596.500	3 113	94.02
	Asymp. Sig.(2 tailed)	.008	5 60	73.78
3 & 6	Mann-Whitney U	820.000	3 113	70.74
	Asymp. Sig.(2 tailed)	.018	6 21	50.05
4 & 5	Mann-Whitney U	1678.500	4 72	73.19
	Asymp. Sig.(2 tailed)	.020	5 60	58.48
4 & 6	Mann-Whitney U	534.500	4 72	50.08
	Asymp. Sig.(2 tailed)	.033	6 21	36.45

2:25-34; 3:35-44; 4:45-54; 5:55-64; 6:65 and above
1:Never; 2:Seldom; 3:Sometimes; 4:Usually; 5:Always (for nutrition label usage)

Table 4: Kruskal-Wallis Test Results With Respect to 'Income'

Test Statistics		N		Mean Rank
		1	4	229.88
		2	57	213.04
Chi-square	12.248	3	101	236.62
df	6	4	100	220.24
Asymp.Sig.	.047	5	102	220.90
		6	66	239.76
		7	15	126.27

1: 0-500TL; 2:500-1000TL; 3:1001-1500TL; 4:1501-2000TL; 5:2001-3000TL; 6:3001-5000TL; 7:5000+TL
1:Never; 2:Seldom; 3:Sometimes; 4:Usually; 5:Always (for nutrition label usage)

Table 4A: Mann Whitney U Test Results With Respect to Pair-wise Comparisons of the Relevant Income Groups

Pair-wise comparisons among the different groups, completed using the Mann-Whitney U Test, yielded the following significant results:

Statement	Test Statistics		N	Mean Rank
*2&7	Mann-Whitney U	273.500	2* 57	39.20
	Asymp. Sig.(2 tailed)	.028	7 15	26.23
3&7	Mann-Whitney U	396.500	3 101	62.07
	Asymp. Sig.(2 tailed)	.002	7 15	34.43
4&7	Mann-Whitney U	436.500	4 100	61.14
	Asymp. Sig.(2 tailed)	.007	7 15	37.10
5&7	Mann-Whitney U	414.500	5 102	62.44
	Asymp. Sig.(2 tailed)	.002	7 15	35.63
6&7	Mann-Whitney U	238.000	6 66	44.89
	Asymp. Sig.(2 tailed)	.001	7 15	23.87

*2:500-1000TL; 3:1001-1500TL; 4:1501-2000TL; 5:2001-3000TL; 6:3001-5000TL; 7:5000+TL
[1:Never; 2:Seldom; 3:Sometimes; 4:Usually; 5:Always (for nutrition label usage)]

Regarding 'education', even though there are some statistically significant differences between the different education levels, these results are somewhat unclear as they are not in the same direction: high school graduates seem to use nutrition labels to a greater extent than literates and primary school graduates as would be expected; however, those who are university or post graduates seem to use nutrition labels less compared to high school graduates. (Tables 5 and 5A)

Table 5: Kruskal-Wallis Test Results With Respect to 'Education'

Test Statistics		N		Mean Rank
Chi-square	7.715	1	124	233.46
df	3	2	65	266.52
Asymp.Sig.	.037	3	199	266.60
		4	112	231.46

1= literates and 2=primary school graduates were recoded as 1; 3=secondary school graduates were recoded as 2; 4=high school graduates were recoded as 3; 5=university and 6=post graduates were recoded as 4
1:Never; 2:Seldom; 3:Sometimes; 4:Usually; 5:Always (for nutrition label usage)

Table 5A: Mann Whitney U Test Results With Respect to Pair-wise Comparisons of the Education Levels

(Pair-wise comparisons among the different groups, completed using the Mann-Whitney U Test, yielded the following significant results)

Statement	Test Statistics		N		Mean Rank
1 & 3	Mann-Whitney U	10733.000	1	124	149.06
	Asymp. Sig.(2 tailed)	.038	3	199	170.07
3 & 4	Mann-Whitney U	9554.500	3	199	163.99
	Asymp. Sig.(2 tailed)	.028	4	112	141.81

1= literates and 2=primary school graduates were recoded as 1; 4=high school graduates were recoded as 3; 5=university and 6=post graduates were recoded as 4
1:Never; 2:Seldom; 3:Sometimes; 4:Usually; 5:Always (for nutrition label usage)

Results with respect to the hypothesis regarding 'household size', seem to be unclear, too, since the significant differences do not point out to a meaningful explanation. (Tables 6 and 6A).

Table 6: Kruskal-Wallis Test Results With Respect to 'Size of Household'

Test Statistics		N		Mean Rank
Chi-square	18.259	1*	60	281.95
df	9	2	62	224.98
Asymp.Sig.	.032	3	118	261.43
		4	136	259.40
		5	74	234.44
		6	31	202.89
		7	10	272.90
		8	5	134.60
		9	2	416.25
		10	2	192.00

*1: one individual; 2: two individuals; 3:three individuals... 10:ten individuals;
1:Never; 2:Seldom; 3:Sometimes; 4:Usually; 5:Always (for nutrition label usage);

Table 6A: Mann Whitney U Test Results With Respect to Pair-wise Comparisons of the Relevant Household Sizes

(Pair-wise comparisons among the different groups, completed using the Mann-Whitney U Test, yielded the following significant results)

Statement	Test Statistics		N		Mean Rank
*1&2	Mann-Whitney U	1418.000	1*	6	68.87
	Asymp. Sig.(2 tailed)	.016	2	62	54.37
1&6	Mann-Whitney U	621.000	1	60	51.15
	Asymp. Sig.(2 tailed)	.006	6	31	36.03
1&8	Mann-Whitney U	66.500	1	60	34.39
	Asymp. Sig.(2 tailed)	.024	8	5	16.30
3&6	Mann-Whitney U	1406.000	3	118	78.58
	Asymp. Sig.(2 tailed)	.039	6	31	61.35
4&6	Mann-Whitney U	1612.000	4	136	87.65
	Asymp. Sig.(2 tailed)	.032	6	31	68.00
4&8	Mann-Whitney U	166.000	4	136	72.28
	Asymp. Sig.(2 tailed)	.041	8	5	36.20
6&9	Mann-Whitney U	5.500	6	31	16.18
	Asymp. Sig.(2 tailed)	.044	9	2	29.75

*1: one individual; 2: two individuals; 3:three individuals... 10:ten individuals
1:Never; 2:Seldom; 3:Sometimes; 4:Usually; 5:Always (for nutrition label usage)

The hypotheses regarding 'concern about nutrition and health' (Tables 7 and 8), 'organic product purchasers' (Tables 9 and 9A), 'health concern ownership necessitating careful choice of foods' (Table 10), 'being on a diet' (Table 11), and 'first time purchases' (Table 11) yielded significant results, all being positive; hence they are all accepted.

Table 7: Mann-Whitney U Test Results With Respect To 'Attitudes Toward a Healthy Diet, Nutritious Eating, and Food Labels'

Statement	Test Statistics		N		Mean Rank
My food choice is better when I use food labels.	Mann-Whitney U	21538.000	1*	350	254.96
	Asymp. Sig. (2 tailed)	.021	2	141	223.75
In choosing foods, I prefer looking at food labels to learn about the ingredients rather than relying on my own knowledge.	Mann-Whitney U	22063.500	1	351	256.14
	Asymp. Sig. (2 tailed)	.027	2	143	226.29
I always read food labels as being healthy is important for me.	Mann-Whitney U	19734.000	1	372	254.45
	Asymp. Sig. (2 tailed)	.033	2	121	224.09

*1: those who agree; 2: those who do not agree (4=strongly agree and 3=agree were recoded as 1; 2=disagree and 1=strongly disagree were recoded as 2)
1:Never; 2:Seldom; 3:Sometimes; 4:Usually; 5:Always (for nutrition label usage)

Table 8: Kruskal-Wallis Test Results With Respect to Importance Given to a Healthy Diet and Nutritious Eating

Statement	Test Statistics		N		Mean Rank
Usage of salt and sodium only as needed	Chi-square	20.554	1*	356	267.05
	df	2	2	36	176.35
	Asymp.Sig.	.000	3	108	220.66
Statement	Test Statistics		N		Mean Rank
Preferring a diet low in fat	Chi-square	24.558	1	336	269.68
	df	2	2	36	166.74
	Asymp.Sig.	.000	3	128	223.72
Statement	Test Statistics		N		Mean Rank
Preferring a diet low in saturated fat	Chi-square	23.544	1	310	272.58
	df	2	2	59	190.11
	Asymp.Sig.	.000	3	131	225.44
Statement	Test Statistics		N		Mean Rank
Preferring a diet high in vegetables and fruits	Chi-square	18.542	1	315	269.94
	df	2	2	53	196.77
	Asymp.Sig.	.000	3	132	225.68
Statement	Test Statistics		N		Mean Rank
Preferring a diet low in sugar	Chi-square	16.946	1	318	267.19
	df	2	2	57	190.39
	Asymp.Sig.	.000	3	125	235.44
Statement	Test Statistics		N		Mean Rank
Preferring a diet with sufficient amount of fiber	Chi-square	30.615	1	326	272.09
	df	2	2	46	161.60
	Asymp.Sig.	.000	3	128	227.47
Statement	Test Statistics		N		Mean Rank
Presence of variety in the amount of food consumed	Chi-square	34.096	1	341	272.68
	df	2	2	48	160.77
	Asymp.Sig.	.000	3	111	221.17
Statement	Test Statistics		N		Mean Rank
Maintaining a healthy weight	Chi-square	24.050	1	352	268.00
	df	2	2	30	158.85
	Asymp.Sig.	.000	3	118	221.61
Statement	Test Statistics		N		Mean Rank
Preferring a diet low in cholesterol	Chi-square	35.401	1	338	275.21
	df	2	2	33	168.85
	Asymp.Sig.	.000	3	129	206.64
Statement	Test Statistics		N		Mean Rank
Consuming at least two servings of milk/dairy products daily	Chi-square	34.727	1	371	269.85
	df	2	2	32	141.05
	Asymp.Sig.	.000	3	97	212.59

*1:those who find it important; 2: those who do not find it important; 3:those who neither find it important nor unimportant (5=Very important and 4=Important have been recoded as 1; 2=Not important and 1:Not important at all have been recoded as 2; 3=Neither important nor unimportant has not been recoded)

1:Never; 2:Seldom; 3:Sometimes; 4:Usually; 5:Always (for nutrition label usage)

Pair-wise comparisons among the relevant groups completed using the Mann-Whitney U Test may be obtained from the author upon request.

Table 9: Kruskal-Wallis Test Results With Respect to Organic Product Purchase Frequency

Test Statistics		N		Mean Rank
Chi-square	52.034	1	223	292.06
df	2	2	89	169.51
Asymp.Sig.	.000	3	188	239.54

1:those who buy organic food; 2: those who do not buy organic food;
3:those who sometimes buy organic food (5=Always and 4=Usually have been recoded as 1; 2=Seldom and 1:Never have been recoded as 2;

3=Sometimes has not been recoded (for organic food purchases)
1:Never; 2:Seldom; 3:Sometimes; 4:Usually; 5:Always (for nutrition label usage)

Table 9A: Mann Whitney U Test Results With Respect to Pair-wise Comparisons of the Relevant Groups

Pair-wise comparisons among the different groups, completed using the Mann-Whitney U Test, yielded the following significant results:

Statement	Test Statistics		N		Mean Rank
*1&2	Mann-Whitney U	5181.000	1*	223	177.77
	Asymp. Sig.(2 tailed)	.000	2	89	103.21
1&3	Mann-Whitney U	16436.500	1	223	226.29
	Asymp. Sig.(2 tailed)	.000	3	188	181.93
2&3	Mann-Whitney U	5900.500	2	89	111.30
	Asymp. Sig.(2 tailed)	.000	3	188	152.11

*1:those who buy organic food; 2: those who do not buy organic food;
3:those who sometimes buy organic food
1:Never; 2:Seldom; 3:Sometimes; 4:Usually; 5:Always (for nutrition label usage)

Table 10: Mann-Whitney U Test Results With Respect to 'Health Concern Ownership'

Test Statistics		N*		Mean Rank
Mann-Whitney U	12938.000	Yes	72	284.81
Asymp. Sig.(2 tailed)	.023	No	428	244.73

1:Never; 2:Seldom; 3:Sometimes; 4:Usually; 5:Always (for nutrition label usage)

Table 11: Kruskal-Wallis Test Results With Respect to 'Label Readership Under Various Conditions'

Statement	Test Statistics		N		Mean Rank
If the product is launched on the market quite recently	Chi-square	63.608	1*	340	283.92
	df	2	2	26	150.81
	Asymp.Sig.	.000	3	134	185.05
Statement	Test Statistics		N		Mean Rank
If the product is being purchased for the first time or if it is a product that is not purchased frequently	Chi-square	45.896	1	334	277.76
	df	2	2	41	147.39
	Asymp.Sig.	.000	3	125	211.47
Statement	Test Statistics		N		Mean Rank
If the individual or one of his/her family members has a health related concern necessitating careful choice of foods	Chi-square	28.979	1	304	275.06
	df	2	2	44	173.83
	Asymp.Sig.	.000	3	152	223.58
Statement	Test Statistics		N		Mean Rank
If the person is on a diet to lose weight	Chi-square	24.753	1	290	275.75
	df	2	2	66	197.54
	Asymp.Sig.	.000	3	144	223.93
Statement	Test Statistics		N		Mean Rank
If the individual is trying to stay in form or be fit	Chi-square	46.618	1	302	281.98
	df	2	2	50	157.98
	Asymp.Sig.	.000	3	148	217.52

*1: those who read; 2: those who do not read; 3: those who sometimes read
(5=Always and 4=Usually have been recoded as 1; 2=Seldom and 1=Never have been recoded as 2;
3=Sometimes has not been recoded)
1:Never; 2:Seldom; 3:Sometimes; 4:Usually; 5:Always (for nutrition label usage)

Pair-wise comparisons among the relevant groups completed using the Mann-Whitney U Test may be obtained from the author upon request.

Besides, although a majority of the hypotheses were not supported, some 'not-hypothesized' significant relationships were encountered: Those who aim at being or staying fit (Table 11), who trust nutrition claims on food labels (Table 12), who find nutrition labels easier to understand (Table 13), who follow-up nutrition-related news in the media (Table 14), and who perceive the healthiness of their eating habits to be good (Tables 15 and 15A) are more likely to use nutrition labels, compared to those who do not. As such, it seems that different aspects of "concern about, interest in, and importance given to health and nutritious eating" are influential in nutrition label use in the Turkish market.

Table 12: Mann-Whitney U Test Results With Respect to the 'Perceived Trustworthiness of Various Claims on Food Labels'

Statement	Test Statistics		N		Mean Rank
Low fat	Mann-Whitney U	23176.000	1*	296	260.20
	Asymp. Sig.(2 tailed)	.001	2	190	217.48
Low cholesterol	Mann-Whitney U	23768.000	1	273	262.94
	Asymp. Sig.(2 tailed)	.000	2	213	218.59
High fiber	Mann-Whitney U	24738.500	1	268	253.19
	Asymp. Sig.(2 tailed)	.014	2	211	223.24
Light	Mann-Whitney U	23074.000	1	266	265.76
	Asymp. Sig.(2 tailed)	.000	2	219	215.36
Healthy	Mann-Whitney U	24255.500	1	271	261.50
	Asymp. Sig.(2 tailed)	.001	2	215	220.82
Extra skimmed	Mann-Whitney U	23339.500	1	267	266.59
	Asymp. Sig.(2 tailed)	.000	2	220	216.59
100% natural	Mann-Whitney U	24703.000	1	256	260.00
	Asymp. Sig.(2 tailed)	.002	2	228	222.85

*1: those who find it trustworthy; 2: those who do not find it trustworthy (4=very trustworthy and 3=trustworthy were recoded as 1; 2=not trustworthy and 1=not trustworthy at all were recoded as 2)
1:Never; 2:Seldom; 3:Sometimes; 4:Usually; 5:Always (for nutrition label usage)

Table 13: Mann-Whitney U Test Results With Respect to the 'Extent to Which Nutrition Labels Can Be Understood'

Statement	Test Statistics		N		Mean Rank
Ingredients list	Mann-Whitney U	18887.000	1*	335	268.62
	Asymp. Sig. (2 tailed)	.000	2	157	199.30
Claims like low fat, light, low calorie, diet product, high fiber	Mann-Whitney U	23158.000			
	Asymp. Sig. (2 tailed)	.001	1 2	301 187	261.06 217.84
Amount of calories per serving	Mann-Whitney U	20321.500			
	Asymp. Sig. (2 tailed)	.000	1 2	272 217	278.79 202.65
Amount of calories from fat per serving	Mann-Whitney U	21906.000			
	Asymp. Sig. (2 tailed)	.000	1 2	275 212	270.34 209.83
Gram/mg values of sodium/salt, vitamins, and minerals per serving	Mann-Whitney U	19734.000			
	Asymp. Sig. (2 tailed)	.000	1 2	289 197	273.72 199.17
Percent daily values of each nutrition	Mann-Whitney U	20245.000			
	Asymp. Sig. (2 tailed)	.000	1 2	294 193	271.64 201.90

*1: those who find it easy to understand; 2: those who do not find it easy to understand
4=very easy and 3=easy were recoded as 1; 2=not easy and 1=not easy at all were recoded as 2
1:Never; 2:Seldom; 3:Sometimes; 4:Usually; 5:Always (for nutrition label usage)

Table 14: Mann-Whitney U Test Results With Respect to 'Follow-up of Nutrition-Related News in the Media'

Test Statistics		N		Mean Rank
Mann-Whitney U	19512.500	Yes	361	265.95
Asymp. Sig.(2 tailed)	.000	No	139	210.38

1:Never; 2:Seldom; 3:Sometimes; 4:Usually; 5:Always (for nutrition label usage)

Table 15: Kruskal-Wallis Test Results With Respect to Perceived Healthiness of One's Eating Habits

Test Statistics		N		Mean Rank
Chi-square	26.705	1	310	274.89
df	2	2	22	179.89
Asymp.Sig.	.000	3	168	214.74

1:those who think their eating habits to be healthy; 2: those who think their eating habits to be unhealthy; 3:those who neither think it to be healthy nor unhealthy
5=Very healthy and 4=Healthy have been recoded as 1; 2=Unhealthy and 1:Very unhealthy have been recoded as 2; 3=Neither healthy nor unhealthy has not been recoded
1:Never; 2:Seldom; 3:Sometimes; 4:Usually; 5:Always (for nutrition label usage)

Table 15A: Mann Whitney U Test Results With Respect to Pair-wise Comparisons of the Relevant Groups

Pair-wise comparisons among the different groups, completed using the Mann-Whitney U Test, yielded the following significant results:

Statement	Test Statistics		N		Mean Rank
*1&2	Mann-Whitney U	2129.000	1*	310	170.63
	Asymp. Sig.(2 tailed)	.002	2	22	108.27
1&3	Mann-Whitney U	19760.500	1	310	259.76
	Asymp. Sig.(2 tailed)	.000	3	168	202.12

*1:those who think their diet to be healthy; 2: those who think their diet to be unhealthy;
3:those who neither think it to be healthy nor unhealthy
1:Never; 2:Seldom; 3:Sometimes; 4:Usually; 5:Always (for nutrition label usage)

One other point related to income, that was not studied in earlier research, questioned the relationship of nutrition label use across individuals living in the different districts of the city. Parallel to findings with respect to 'income', those 'living in high income districts' seem to use nutrition labels less, compared to those who live in the middle and low income level districts. (Tables 16 and 16A)

Table 16: Kruskal-Wallis Test Results With Respect to 'Income of District the Respondent Lives At'

Test Statistics		N		Mean Rank
Chi-square	7.629	1	138	261.93
df	2	2	317	253.02
Asymp.Sig.	.022	3	45	197.72

1: low; 2: middle; 3: high
1:Never; 2:Seldom; 3:Sometimes; 4:Usually; 5:Always (for nutrition label usage);

Table 16A: Mann Whitney U Test Results With Respect to Pair-wise Comparisons of the Relevant Districts

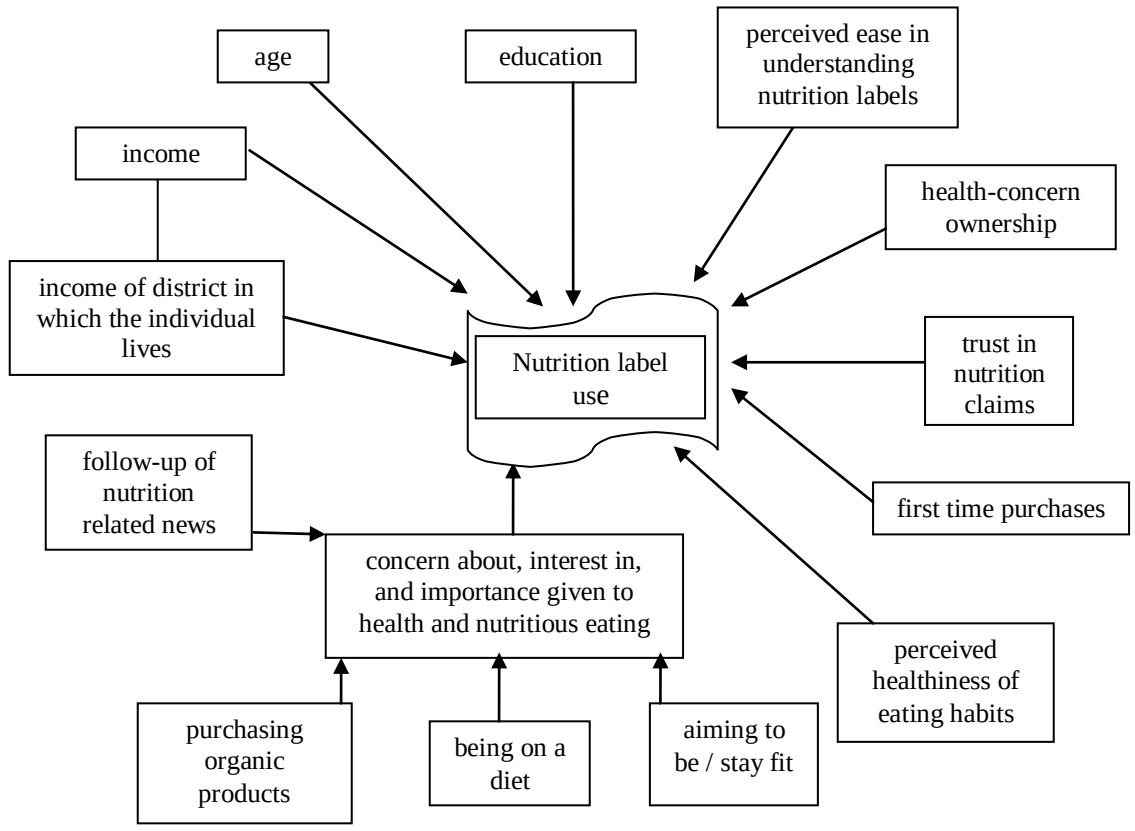
Pair-wise comparisons among the different groups, completed using the Mann-Whitney U Test, yielded the following significant results:

Statement	Test Statistics		N		Mean Rank
*1&3	Mann-Whitney U	2302.500	1*	138	97.82
	Asymp. Sig.(2 tailed)	.006	3	45	74.17
2&3	Mann-Whitney U	5560.000	2	317	186.46
	Asymp. Sig.(2 tailed)	.013	3	45	146.56

*1: low; 2: middle; 3:high
1:Never; 2:Seldom; 3:Sometimes; 4:Usually; 5:Always (for nutrition label usage)

The framework reflecting the prevailing determinants of nutrition label use that have been revealed in this study is shown in Figure 2.

Figure 2: The Framework Reflecting the Prevailing Determinants of Nutrition Label Use in the Turkish Market



5. Conclusions and Implications

Factors that are influential in individuals' nutrition label use in the Turkish market were studied in this paper based on a set of hypotheses that were developed upon a thorough review of the literature. Unexpectedly, the hypotheses regarding 'gender', 'marital status', 'preschool child ownership', 'working status', 'time pressure', 'nutrition knowledge', 'importance given to price', and 'awareness of diet-disease relation' were all rejected as they yielded insignificant results. There seems to be no difference between males versus females, those who are married versus those who are not, those who have children versus those who do not, those who work versus those who do not, those who are under time pressure versus those who are not, those who have nutrition knowledge versus those who do not, those who give importance to price versus those who do not, and those who are aware of diet-disease relation versus those who are not.

These results seem to be in contradiction with much of the earlier research and possibly reflect the peculiarities special to the Turkish market. Nevertheless, they carry an important implication for food manufacturers and retailers; the respective groups do not necessitate the use of differentiated targeting efforts.

The hypotheses regarding 'age' and 'income' resulted in significant results; however, contrary to most of the earlier studies, the direction of the relationship was negative rather than positive. Those who are 55 and more years of age seem to use nutrition labels less compared to those who are in between 25 and 54 and those who have 'high levels of income' seem to use nutrition labels less, compared to those who have middle and low income levels. Parallel to findings with respect to 'income', those 'living in high income districts' seem to use nutrition labels less, compared to those who live in the middle and low income level districts of the city. It is mostly probable that the relatively older individuals have much difficulty in reading the small-sized letters on food labels; moreover, even if they can read the labels, it is quite likely that they will not understand them. The reason for the lower extent of nutrition label use among higher income individuals is not very clear. As has also been indicated in Schupp et al.'s (1998) study, it may be that these individuals work for longer hours and are in a position to spend less time while shopping or they may also eat outside their homes more frequently and not be so much concerned about the nutritional content of foods prepared at home. But given the finding that 'time pressure does not have a significant effect on nutrition label use', the former explanation does not sound to be very likely.

Regarding 'education', even though there are some statistically significant differences between the different education levels, these results are also somewhat unclear as they are not in the same direction: high school graduates seem to use nutrition labels to a greater extent than literates and primary school graduates as would be expected; however, those who are university or post graduates seem to use nutrition labels less compared to high school graduates. Hence, it seems that high school graduates are the most concerned / interested group with respect to nutrition label use. It may be suggested that those respondents who are above 55 years of age, who are university/post graduates, and who live in high income districts of the city should be targeted in a sensitive manner and differing levels of effort should be directed at each respective group, as they seem to be the least "interested/ concerned" parties with respect to their attitudes, opinions, and self-reported practices on nutritious eating, healthy diet, and nutrition labels.

The hypotheses regarding 'concern about nutrition and health', 'organic product purchasers', 'health concern ownership necessitating careful choice of foods', 'being on a diet', and 'first time purchases' were accepted because they all yielded positive significant results.

Besides, even though a majority of the hypotheses were not supported, some 'not-hypothesized' significant relationships were encountered in the study: Those who 'trust nutrition claims on food labels', who 'aim at being or staying fit', who 'find nutrition labels easier to understand', who 'follow-up nutrition-related news in the media', and who 'perceive the healthiness of their eating habits to be good' are more likely to use nutrition labels, compared to those who do not. As such, it seems that different aspects of "concern about, interest in, and importance given to health and nutritious eating" are influential in nutrition label use in the Turkish market.
As Grunert et al. (2010) point out, one of the problems in increasing use of nutrition labels and hence healthy consumer food choices, lies with the fact that even if people are able to use nutrition labels, they may just not do so because of a lack of motivation. How to motivate individuals to make use of nutrition labels requires both the governmental bodies, food manufacturers, retailers, and possibly researchers present some solutions to this problem.

It has been stated in Worsley's study (1996) that there is interest in negative ingredients; consumers are inclined to check labels first for things that may harm them. Parallel to this approach, individuals may also be encouraged to get interested in and educated through by highlighting the ill health element of poor nutrition. Such messages may be more effective in convincing consumers to use food labels than strategies emphasizing specialized knowledge about the nutrient content of foods. (Nayga, 2000). Based on these findings, persuading people to use nutrition labels by pointing out to the negative consequences of not using them also seems to be possible. Hence, food manufacturers may as well include the negative ingredients on labels.

One of the findings of this study reflects that trust in claims has a significant effect on the use of labels. This is an important implication on the part of food producers as consumers' trust in information on food labels would increase if there is a clear trustworthy sender.

Hence, it might be a good idea to deliver such information through scientists and health professionals, in the first place, as industry is usually perceived to be less trustworthy. (Vyth et al.,2009). The perceived ease of understanding the nutrition label has a positive influence on the use of labels, as well.It will be difficult to increase label use by less concerned consumers unless trust in food labels and their ease of use and understanding are first addressed, as has also been stated in the Mhurchu and Gorton (2007) study. As such, a standardized and simple format that is easy and quick to comprehend would also help consumers in their use of nutrition labels.
Given the results of analyses regarding follow-up of nutrition related news in the media, it can be concluded that follow-up of news creates a significant awareness of, interest in, and knowledge about health-related considerations, inclusive of nutrition label use. Therefore, media should be used to the greatest possible extent and through conferences, seminars, television programs, etc., the learning process of, at least, the "interested/ concerned" individuals should further be improved.

Awareness with respect to the benefits of nutrition label use may also be increased by researchers through further research in this area. Even the questionnaires used for the present study aroused awareness and attention among the majority of respondents. Through regular research, public sensitivity on health-related considerations may be increased, at least to a higher extent, using both print and broadcast media as a means of communicating the results of such studies to the public. Inclusion of some self-reported practices may be considered to be a limitation of this study because the social desirability bias may be in scene; respondents may possibly not remark on their actual behavior when asked by someone (Redmond & Griffith, 2003). Yet, it should not be forgotten that they provide valid information on awareness and also whether consumers have at least some knowledge about 'correct' behaviors even if they may not exercise these behaviors all of the time. Nevertheless, future research should consider this potential shortcoming and observe individual behaviors, as well, besides asking for respondents' replies.

Although this study pertains to the prevailing situation in the Turkish market, implications of the study may be applicable in other countries as well, where nutrition labeling is not mandatory at least for the time being. As Wem (2002) points out, exchange of information at the regional and sub-regional level is also important, as each country can learn from the experience of others and regional coordination and cooperation can be developed. An intensive public debate on nutrition and labeling issues can indeed affect people's thinking and behavior (Grunert et al., 2010) and the more this debate can be initiated in the different regions of the world, the more the probability of making improvements in peoples' lives all over the planet.

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