The Relationship between Nutritional Facts Labeling and Students' Knowledge

Arkan B. Nagi, Ph D
Instructor, Community Health Nursing Department
College of Nursing, University of Baghdad

Abstract:

Objective: The study aims to find the relationship between students' knowledge toward nutritional facts labeling and their demographic characteristics.

Methodology: Descriptive design study was carried out in the Colleges of Baghdad City (College of Arts and College of Nursing) during 1st June 2010 to 1th July 2011. Random sample was selected from [200] student college in Baghdad City and the study instrument was questionnaire for data collected by using direct interview. The data were analyzed by using descriptive statistical approach [frequency, percentage, and mean of score] and inferential data analysis approach [chi- square].

Results: The finding of the study was indicated that the large number of students had enough
knowledge about nutritional facts labeling.

Recommendation: The study recommended that students' knowledge about nutritional fact labeling improved by education program at all universities in Iraq.

Key Words: Nutritional Fact Labeling, Nutritional Knowledge, Health.

Introduction:

One of the major instruments in trying to bring more healthy eating patterns has been nutrition labeling. Nutrition labeling is an attempt to provide consumers, at the point of purchase, with information about the nutrition content of individual food products, in order to enable consumers to choose nutritionally appropriate food [1].

Front of pack food labels are currently widely to help consumers by the best understood way to differentiate between more or less healthy foods for informed food choices. A mistake of food
choices may lead to overweight and obesity which are increasing health problems. Worldwide more than 1.6 billion people (age 15+) are overweight, and approximately 400 million adults are obese [2]. Germany is one of the countries with the highest prevalence of overweight among adults (BMI >25) in the European Union [3].

Hence, consumer interests in health and diet issues have increased and consequently nutrition labeling has received considerable attention. Interpretational aids can help consumers to appraise the nutrient contribution of specific foods to the overall diet enabling informed consumer choices, leading to the consumption and consequently to the production of healthier products [4, 5]. However, research on nutrition information on packed foods showed that the given information is often misinterpreted, confusing and inappropriate for estimating an individual product's contribution to the overall diet [6, 7].

The consumers who are more concerned about nutrition and health are more likely to use nutritional labels. Consequently, consumers on a special diet which is aware of the diet-disease relation more likely to search about pack nutrition information than others [8].

Caswell and Mo-jduszka (1996) argued that the credence attribute of nutritional content can be transformed into a search attribute when a nutritional label is present. May help consumers make healthier food choices and, therefore, help reduce diet-related diseases [9].

Globally, diet-related health problems have increased dramatically over the last few years. Consequently, nutritional labeling has emerged as an important aspect of the food purchasing decision both for the scientific and the non-scientific literature [8, 10, and 11].

Nevertheless, EU Regulation 1924/2006 introduced a European legal framework for nutrition messages for food product labels. Consumer interest towards nutrition labeling and claim , and examines the information consider important during their purchasing decisions [12] .

Methodology

A Descriptive design is carried out to identify the students' knowledge toward smart shopping.

This study is conducted during the period from June 1st, 2010 to July 1th, 2011 in the College of Nursing and College of Arts in Baghdad City.

Random Sample of [200] students' is selected from Colleges in Baghdad City (College of Arts and College of Nursing) and different level of education. A questionnaire is designed and constructed through extensive review of available literature to assess the nutritional facts labeling information.

A questionnaire format is consisted of two parts, which consists:

Part 1: Demographic characteristics.

Part 2: Students knowledge toward food labeling.

Data are collected through the direct interview with these students and using constructed questionnaire format. The panel of experts was determined the validity of the instrument that related to the study.

Data are analyzed through the application of descriptive statistical approach such as; [frequency, percentage, and mean of score] and inferential statistical approach, such as [chi-square].

Results of the study:

Table [1]: Distribution of students' demographic characteristic

List	Demographic characteristics	frequency	Percentage%
1.	**Age**		
	18 - 20	86	43.0
	21 – 23	63	31.5
	24 and more	51	25.5
	total	200	100.0
2.	**Gender**		
	Male	143	71.5
	female	57	28.5
	total	200	100.0
3.	**Marital Status**		
	Single	173	86.5
	married	27	13.5
	total	200	100.0
4.	**Students' Grade**		
	1st stage	65	32.5
	2nd stage	48	24.0
	3rd stage	55	27.5
	4th stage	32	16.0
	total	200	100.0

The findings of this table revealed that most of the students' were aged [18-20] years old [43%], male[71.5 %], single[86.5 %], and who had first stage [32.5%].

Table [2]: Distribution of students' information toward family Chronic Diseases

List	Chronic Diseases	frequency	Percentage%
1.	**Chronic Diseases**		
	yes	75	37.5
	no	125	62.5
	total	200	100.0
2.	**Hypertension**		
	yes	59	29.5
	no	141	70.5
	Total	200	100.0
3.	**Diabetes Mellitus**		
	yes	47	23.5
	no	153	76.5
	total	200	100.0
4.	**Obesity**		
	yes	11	5.5
	no	189	94.5
	total	200	100.0
5.	**Hypercholesterolemia**		
	yes	16	8.0
	no	184	92.0
	total	200	100.0
6.	**Peptic ulcer**		
	yes	14	7.0
	no	186	93.0

	total	200	100.0

This table is revealed that the majority of family who had not chronic disease (62%), (70%) without hypertension, not diabetes mellitus (76.5), not obesity (94.5%), (92 %) without hypercholesterolemia, and not peptic ulcer (93%).

Table [3]: Mean of score for students' knowledge items

List	Items related to students' knowledge	Always		Sometimes		Never		M.S	C.S
		F	%	F	%	F	%		
1	Do you **shopping by self**?	53	26.5	124	62	23	11.5	2.15	S
2	Do you know the **present of nutritional facts labeling?**	20	10	148	74	32	16	1.94	S
3	Do you use the **nutritional facts label** when deciding to buy food product?	35	17.5	130	65	35	17.5	2.00	S
4	Do you use the **list of ingredients** when deciding to buy a food product?	29	14.5	122	61	49	24.5	1.90	S
5	Do you use information on **the serving size** when deciding to buy a food product?	37	28.5	115	57.5	48	24	1.95	S
6	Do you use this kind of **health claim** when deciding to buy a food product?	27	13.5	108	54	65	32.5	1.81	S
7	Do you look for information about **calories**?	34	17	121	60.5	45	22.5	1.95	S
8	Do you look for information about **calories from fat**?	46	23	120	60	34	17	2.06	S
9	Do you look for information about **total fat**?	38	19	127	63.5	35	17.5	2.02	S
10	Do you look for information about **trans fat**?	59	29.5	110	55	31	15.5	2.14	S
11	Do you look for information about **saturated fat**?	60	30	116	58	24	12	2.18	S
12	Do you look for information about **cholesterol**?	60	30	112	56	28	14	2.16	S
13	Do you look for information about **sodium**?	55	27.5	108	54	37	18.5	2.09	S
14	Do you look for information about **carbohydrates**?	51	25.5	122	61	27	13.5	2.12	S
15	Do you look for information about **fibers**?	59	29.5	112	56	29	14.5	2.15	S
16	Do you look for information about **sugars**?	55	27.5	118	59	27	13.5	2.14	S
	Total	718		1913		569			

The mean of scores is significant on all items.

Table [4]: Association between the students' knowledge and their age distribution.

Age [years]	students' knowledge			
	Never	Sometimes	Always	Total
18 - 20	248	839	289	1376
21-23	158	618	232	1008
24 and more	163	456	197	816
Total	569	1913	718	3200

$X^2_{obs.}= 10.036$	df= 4	$X^2_{crit.}= 9.49$

$P \leq 0.05$

A significant association was determined between the students' knowledge and their age distribution.

Table [5]: Association between the students' knowledge and their gender distribution.

Gender	Students' Knowledge			
	Never	Sometimes	Always	Total
Male	386	1422	480	2288
Female	183	491	238	912
Total	569	1913	718	3200
$X^2_{obs.}$= 18.892	df= 2	$X^2_{crit.}$= 5.991		P$\leq$0.05

   A significant association was determined between the students' knowledge and their gender distribution.

Table [6]: Association between the students' knowledge and their grade distribution.

Grade	students' knowledge			
	Never	Sometimes	Always	Total
1st	168	672	200	1040
2nd	141	441	186	768
3rd	158	511	211	880
4th	102	289	121	512
Total	569	1913	718	3200
$X^2_{obs.}$= 16.302	df= 6	$X^2_{crit.}$= 12.592		
P$\leq$0.05				

   A significant association was determined between the students' knowledge and their grade distribution.

Discussion:

   The findings of this table (1) revealed that most of the students' were aged (18-20) years old (43%), their gender (71.5 %) males, single (86.5 %), and who had first stage (32.5%).

   Several studies [13, 14, 15, 16, 17] found that women are more interested than men in nutrition information. Others reported that men are less reading of nutrition labels than women [18, 19, 20]. However, young women may be interested in nutrition for the reasons of weight control [21, 22] and aesthetic concerns [17]. But Bender and Derby (1992) found that younger people tend to read both the nutritional labels and ingredient lists, or just the nutritional labels. In addition, the better educated individuals look at both nutritional labels and ingredient lists [23].

   Although some studies have confirmed that higher educated individuals are more likely to use nutritional labels [24, 25, 26, 27, 28, 29, 30]. Specifically, the sugar and ingredient information in one study [24].

   The table (2) is revealed that the majority of family who had no chronic disease (62%), (70%) without hypertension, no diabetes mellitus (76.5), no obesity (94.5%), (92 %) without hypercholesterolemia, and no peptic ulcer (93%).

In almost the same manner, eating habits have changed worldwide leading to an increased consumption of pre-packed food generally containing high levels of sugar, fat, saturated fatty acids, trans-fatty acids and sodium [31] . To prevent nutrition related diseases the WHO has recommended to improve the nutritional value by reduce these nutrients [32].

It also appears that consumers who are more concerned about nutrition and health are more likely to use nutritional labels. Consequently, consumers on a special diet, organic buyers, and those aware of the diet-disease relation are more likely to search for on-pack nutrition information than others [8].

Caswell and Mo-jduszka (1996) argued that the credence attribute of nutritional content can be transformed into a search attribute when a nutritional label is present. May help consumers make healthier food choices and therefore, help to reduce diet-related diseases [9].

Drichoutis et. al. (2005) shows that Awareness of the diet - disease relation was positively affect on consumers attention to the food caloric content [24].

Nevertheless participants with chronic disease read nutrient information on food labels and whether they were aware of dietary guidelines. Participants were classified into 5 disease categories: 1) hypertension, 2) hypercholesterolemia, 3) diabetes/at risk of diabetes, 4) overweight, and 5) heart disease [33].

The dietary modifications are common treatment strategies among patients with various chronic diseases, Participants who read food labels consumed less energy, saturated fat, carbohydrates, and sugar, and more fiber than those who did not. These findings indicate the value of dietary counseling in chronic disease management [34].

Tabel (3) also shows the mean of scores is significant on all items.

Neuhouser et.al. (1999), shows that the using of food labeling was significantly associated with lower fat intake [35].

In an Irish studies, the top five items respondents wanted from labels were best before data, additive content, fat content, production date and origin. In addition, more than half of the respondents answered "don't know" when asked how much salt or fat they should eat on a typical day [18, 36].

NCNL (2004) found and agreed with the important of nutrition information per 100 g or per serving [37].

Drichoutis et. al. (2006) found that nutrition knowledge has a significant impact on nutritional label use. Nutritional label use is also associated with diets high in vitamin C, low in cholesterol, and lower percentage of calories from fat[8].

Awareness of the diet-disease relation may also positively affect the likelihood of consumers paying attention to the caloric content of foods [24].

The nutrition knowledge may facilitate label use by increasing its perceived benefits and by increasing the efficiency of label use, thereby decreasing the cost of using labels. Early studies of label use found a relationship between

nutrition knowledge or self perception of knowledge and the use of specific nutrients [23]. Moorman and Matulich (1993) showed that higher levels of health knowledge have a positive effect on information acquisition from media sources (including nutrition label reading) [38]. Later, [26, 39, 40] found evidence supporting a positive relationship between label use and knowledge, even though Nayga (2000) found no evidence supporting this relationship [41]. Moorman (1998) also found that consumers with more knowledge were less skeptical toward nutritional information [42]. In addition, Levy and Fein (1998) revealed the positive effect of knowledge on consumer's ability to perform nutrition label use tasks [43].

In fact, Drichoutis et. al. (2005) found that label use in general and use of vitamins, minerals and ingredients information improve consumer's nutrition knowledge [24].

Furthermore, consumers are having difficulties distinguishing between sugar and carbohydrates and sodium and salt [44].

Tabel (4) shows significant association was determined between the students' knowledge and their age distribution.

There has been no consensus on the effect of age on nutritional label use [8]. But, there is a specifically, as age increases so is the likelihood of using the information about fat content [45, 46], cholesterol content [24,46], and health benefits [46].

Neuhouser et.al. 1999, shows that the using of food labeling was highly significant among individuals younger than 35 years [35].

A significant association was determined between the students' knowledge and their gender distribution (Table 5).

Neuhouser et. al. (1999) show that the information of food labeling was highly significant among women [35]. Westenhoefer et. al. (2005) described the differences in food choice between men and women, also women are reported to have higher intakes of fruits, vegetables, dietary fiber and lower intakes of fat. In accordance with such more healthy food choice, women usually attach greater importance to healthy eating. Recently, studies found that explain up to 50 percent of gender differences in food choice. In addition, less healthy food choice profiles of men may be related to their poorer nutritional knowledge [47].

Most of the studies have also found that females are more likely than men to use nutritional labels [48, 26, 27,40, 28].

In contrast, females pay attention to information about calories, vitamins, and minerals [24] and they tend to use both nutrition labels and ingredient lists [23].

Neuhouser et.al. (1999) shows that the using of food labeling was highly significant among women [35]. However, gender (i.e., being female) have been found to positively affect label use [8].

The findings in table (6) A significant association was determined between the students' knowledge and their grade distribution. Whenever, the level of education is increase, the awareness of food labeling will increase.
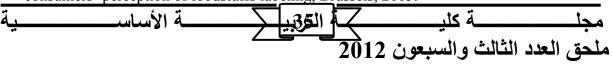
Neuhouser et.al. (1999) shows that the using of food labeling was highly significant among individuals with more than a high school education [35]. However, education have been found to positively affect on label use[8].

Recommendation:

1. Encouragement of all companies and manufacturers to play an important role to provide the canned nutritional products information labels that truthful and not misleads consumers.
2. Subordination of the local canned food products for quality control.
3. Establishing a nutritional fact labeling program toward smart shopping for students at all universities in Iraq.
4. Spreading the nutritional information toward food labeling through the media.

References:

1. Grunert K and Wills J : A review of European research on consumer response to nutrition information on food labels, **J Public Health**, 15, 2007, PP: 385-399.
2. World Health Organization (WHO): Obesity and overweight, What are Overweight and obesity? Fact sheet No. 311, Geneva, **WHO**, 2006.
3. International Association for the Study of Obesity (IASO): Adult overweight and obesity in the European Union (EU25), Overweight in Children in the **European Union** , London, 2007.
4. Baltas G: Nutrition labeling, issues and policies, **Eur J Mark**, 35, 2001, PP: 708–721.
5. Cowburn G and Stockley L: Consumer understanding and use of nutrition labeling, **Public Health Nutr.**, 8, 2005, PP: 21–28.
6. Vijwanathan M and Hastak M: The role of summary information in facilitating consumers' comprehension of nutrition information, **J Public Policy Mark**, 21, 2002, PP: 305–318.
7. Pudel V, Spirik J, and Westenhöfer J : Deutsche Gesellschaft für Ernährung (DGE), Zum Informationsnutzen der Lebensmittelkennzeichnung, für deutsche Konsumenten als Entscheidungshilfe bei der Lebensmittelauswahl, Frankfurt, 1996, PP: 307–325.
8. Drichoutis A , Lazaridis P,and Nayga R : Consumers' use of nutritional labels, **a review of research studies and issues**, Academy of Marketing Science, 9, 2006.
9. Caswell, J and Mojduszka, E : Using informational labeling to influence the market for quality in food products, **American Journal of Agricultural Economics**, 78(5),1996, PP: 1248-53.
10. Sexton, R: A theory on information and its application to the effect of labeling on food products, **Department of Agricultural and Applied Economics**, University of Minnesota, October,1979, PP: 34-79.
11. Zarkin, G and Anderson, D : Consumer and producer responses to nutrition label changes, **American Journal of Agricultural Economics**, 74(5), 1992, PP: 1202-07.
12. Banterle A , and Baldi L : Do Nutrition Claims Matter to Consumers? An Empirical Analysis Considering European Requirements, The Agricultural Economics Society (AES), **Journal of Agricultural Economics**, 61(1), 2010, PP: 15-33.
13. Bureau Européen des Unions des Consommateurs (BEUC): Report on European consumers' perception of foodstuffs labeling, Brussels, 2005.

14. Food Standards Agency(FSA): Health claims on food packaging-consumer-related qualitative research,**Forum Qualitative**, London, 2002.

15. Food Standards Agency (FSA): Quantitative evaluation of alternative food, Signposting concepts, London, 2005b.

16. McDonald's Nutrition Information Initiative (MNII): 2CV Research, London, 2005.

17. Taylor N : Traffic light labeling, **accompanied shopping trips**, UK, 2005.

18. Food Safety Authority of Ireland (FSAI): Consumer attitudes to food safety in Ireland, **Food Safety Authority of Ireland**, Dublin, 2003.

19. Kellogg's Eye: The Oxford Research Agency, UK, ongoing data collection PS, 2005.

20. Svederberg E : Consumers' views regarding health claims on two food packages, **Department of Education, Lund University**, 2002.

21. Food Standards Agency (FAS): Concept testing of alternative labeling of healthy, 2004a.

22. Masterfoods Nutritional labeling (MNL): qualitative exploration, **Deep Blue Research**, UK, 2005.

23. Bender, M. and Derby, B. : Prevalence of reading nutrition and ingredient information on food labels among adult Americans (1982-1988), **Journal of Nutrition Education**, 24,1992, PP: 292- 97.

24. Drichoutis, A., Lazaridis, P., and Nayga, R: Nutrition knowledge and consumer use of nutritional food labels, **European Review of Agricultural Economics**, 32(1),2005, PP: 93-118.

25. Feick, L., Herrmann, R., and Warland, R. : Search for nutrition information, A probit analysis of the use of different information sources, **The Journal of Consumer Affairs**, 20(2), 1986, PP: 173-192.

26. Guthrie, J., Fox, J., Cleveland, L., and Welsh, S.: Who uses nutritional labeling, and What effects does label use have on diet quality? **Journal of Nutrition Education**, 27(4), 1995, PP: 163-172.

27. Kim, S., Nayga, R., and Capps, O. : Food label use, self-selectivity, and diet quality, **The Journal of Consumer Affairs**, 35(2), 2001a, PP: 346 - 363.

28. McLean-Meyinsse, P. : An analysis of nutritional label use in the Southern United States, **Journal of Food Distribution Research**, 32(1), 2001, PP: 110-114.

29. Nayga, R., Lipinski, D., and Savur, N. : Consumers' use of nutritional labels while food shopping and at home, **The Journal of Consumer Affairs**, 32(1), 1998, PP: 106-120.

30. Wang, G., Fletcher, S., and Carley, D.: Consumer utilization of food labeling as a source of nutrition information, **The Journal of Consumer Affairs**, 29(2), 1995, PP: 368-380.

31. Jones G, and Richardson M.: An objective examination of consumer perception of nutrition information based on healthiness ratings and eye movements, **Public Health Nutr.**, 2007;10, 2007, PP: 238–244.

32. World Health Organization (WHO) : Diet, nutrition and the prevention of chronic diseases, Report of a Joint WHO/FAO Expert Consultation, **Technical Report Series**, Geneva, 916, 2002.

33. Lewis J, Arheart K, LeBlanc W, Fleming L, Lee D, Davila E, Cabán-Martinez A, Dietz N, McCollister K, Bandiera F, and Clark J: Food label use and awareness of nutritional information and recommendations among persons with chronic disease, **Am J Clin Nutr.** , 2009, PP: 1351-7.

34. Post R, Mainous A, Diaz V, Matheson E, and Everett C.: Use of the nutrition facts label in chronic disease management, results from the National Health and Nutrition Examination Survey, **J Am Diet Assoc.**,110(4), Apr, 2010, PP: 628-32.

35. Neuhouser M, Kristal A, and Patterson R. : Use of food nutrition labels is associated with lower fat intake, **J Am Diet Assoc.** , Jan, 99(1), 1999, PP: : 45-53.

36. Consumer Tracking Research (CTR): Safe food, **Northern Ireland**, 2004.

37. Nordic Council Nutrition labeling (NCNL): Nordic recommendations based on consumer opinions، **Nordic Council of Ministers**, Copenhagen, 2004.

38. Moorman, C and Matulich, E: A model of consumers' preventive health behaviors, the role of health motivation and health ability, **Journal of Consumer Research**, 20(September), 1993, PP: 208- 28.

39. Szykman, L. , Bloom, P., and Levy, A: A proposed model of the use of package claims and nutri-tion labels, **Journal of Public Policy and Marketing**, 16(2), 1997, PP: 228- 41.

40. Kim, S , Nayga, R , and Capps, O: (2001b). Health knowledge and consumer use of nutritional labels: The issue revisited, **Agricultural and Resource Economics Review**, 30(1), 2001b, PP: 10-19.

41. Nayga, R: Nutrition knowledge, gender, and food label use, **The Journal of Consumer Affairs**, 341, 2000, PP: 97-112.

42. Moorman, C: Market level effects of information, Competitive responses and consumer dynamics, **Journal of Marketing Research**, 35(February),1998, PP: 82-98.

43. Levy, A, and Fein, S: Consumers' ability to perform tasks using nutrition labels, **Journal of Nutrition Education**, 30(4), 1998, PP: 210- 17.

44. Co-operative Wholesale Society (CWS): Lie of the label II, Why dishonest labeling is past its sell-by date, , UK, 2002.

45. Lin, C and Lee, J: Dietary fat intake and search for fat information on food labels, New evidence, **Consumer Interests Annual**, 49, 2003.

46. Nayga, R: Determinants of consumers' use of nutritional information on food packages, **Journal of Agricultural and Applied Economics**, 28(2), 1996, PP: 303- 12.

47. Westenhoefer, J : Age and gender dependent profile of food choice, **Forum Nutr.**, (57), 2005, PP: 44-51.

48. Govindasamy, R and Italia, J: The influence of consumer demographic characteristics on nutritional label usage, **Journal of Food Products Marketing**, 5(4), 1999, PP: 55-68.

الخلاصة:

الهدف: تُهدّفُ الدراسةُ الى ايجاد العلاقة بين معارف الطلبة تجاه لوحة الحقائق الغذائية وصفاتهم الديموغرافية.

المنهجيـــة: دراسة تصميم وصفي تقويمي نُفّذتْ في بعض كليات مدينةِ بغداد (كلية الاداب وكلية التمريض) للفترة مِنْ الاول من حزيران / 2010 إلى الاول من تموز / 2011. تم اختيار عيّنة عشوائية من [200] طالب كلية في مدينة بغداد وكانت اداة الدراسة استبانة لجمع المعلومات بطريقة المقابلةِ المباشرة. تم استخدام الإحصاء الوصفي في التحليل [التكرارات ،النسب المئوية] والتحليلِ الاستنتاجي [مربع كاي].

النتائج: أُشارَت نتائج الدراسةِ بأنّ اغلب الطلبة من الذكوركَانتَ لديهُنّ معارفُ كافيةٌ حول لوحة الحقائق الغذائية.

التوصيات: أوصت الدراسة بتحسين معارف الطلبة حول لوحة الحقائق الغذائية وذلك بأقامة برنامج تثقيفي صحي في جامعات العراق كافة.