Consumer knowledge and utilization of food labels on prepackaged food products in Lagos State

***Olatona F.A.[1], Nwankwo C.O.[1], Ogunyemi A.O.[1], Nnoaham K.E.[2]**

Abstract

Objectives: Consumption of pre-packaged food products which are a risk factor for non-communicable diseases, is on the increase in many developing countries. This study sought to determine the knowledge and utilization of food labels among consumers of pre-packaged food products in Lagos State.

Method: This was a descriptive, cross-sectional study among adults in Lagos, Nigeria. Multi-stage random sampling method was used to select 420 respondents. Only adults who consume pre-packaged foods were included in the study. Data was collected using structured interviewer administered questionnaires and analysis was done using Epi Info 7 statistical software. Level of significance was set at $p<0.05$.

Results: Only 21 (5.0%) respondents had good level of knowledge of food label information. There was a significant association between level of knowledge of food label information and age in this study, level of knowledge increased with increasing age ($p<0.05$). Less than one third of the respondents, 123 (29.2%) made good use of food label information. There was a positive significant association between income and use of food labels. ($p<0.05$).

Conclusion: Levels of knowledge and use of food label information were poor among consumers of pre-packaged food products in Lagos State. There is a need for increased nutrition education of the study population to improve their nutritional knowledge and use of food label information.

Keywords: Food labels, food labelling, consumer knowledge, knowledge of food labels, utilization of food labels, prepackaged food products

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Received: Nov., 27, 2018 *Accepted: March, 13, 2019* *Published: March 31, 2019*

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http://dx.doi.org/10.4314/rejhs.v7i1.4

Connaissance des consommateurs et utilisation des étiquettes sur les produits alimentaires préemballés dans l'état de Lagos

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Resume

Objectifs: La consommation de produits alimentaires préemballés, qui constituent un facteur de risque de maladies non transmissibles, est en augmentation dans de nombreux pays en développement. Cette étude visait à déterminer la connaissance et l'utilisation des étiquettes des produits alimentaires parmi les consommateurs de produits alimentaires préemballés dans l'État de Lagos.

Méthode: Il s'agissait d'une étude descriptive transversale réalisée auprès d'adultes de Lagos, au Nigéria. Une méthode d'échantillonnage aléatoire à plusieurs degrés a été utilisée pour sélectionner 420 répondants. Seuls les adultes consommant des aliments préemballés ont été inclus dans l'étude. Les données ont été collectées à l'aide de questionnaires structurés administrés par un intervieweur et l'analyse a été réalisée à l'aide du logiciel statistique Epi Info 7. Le niveau de signification a été fixé à $p < 0,05$.

Résultats: Seulement 21 répondants (5,0%) avaient un bon niveau de connaissance des informations sur les étiquettes des aliments. Il y avait une association significative entre le niveau de connaissance des informations sur les étiquettes des aliments et l'âge dans cette étude, le niveau de connaissance augmentait avec l'âge ($p < 0,05$). Moins du tiers des répondants, 123 (29,2%) ont bien utilisé les informations figurant sur les étiquettes des produits alimentaires. Il existait une association significative positive entre le revenu et l'utilisation des étiquettes de produits alimentaires. ($p < 0,05$).

Conclusion: les niveaux de connaissance et d'utilisation des informations figurant sur les étiquettes des produits alimentaires étaient faibles chez les consommateurs de produits alimentaires préemballés dans l'État de Lagos. Il est nécessaire de renforcer l'éducation nutritionnelle de la population à l'étude afin d'améliorer ses connaissances nutritionnelles et l'utilisation des informations figurant sur les étiquettes des produits alimentaires.

Mots-clés: étiquettes alimentaires, étiquetage alimentaire, connaissances des consommateurs, connaissance des étiquettes alimentaires, utilisation des étiquettes alimentaires, produits alimentaires préemballés

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Received: Nov., 27, 2018 *Accepted: March, 13, 2019* *Published: March 31, 2019*

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INTRODUCTION

Diet plays an important role in people's health status. Poor diet is a known modifiable risk factor for non-communicable diseases (NCDs) which are among the leading causes of death and disability globally. About 70% of deaths worldwide are attributable to NCDs and they are rising very rapidly in incidence and prevalence in developing countries like Nigeria (1). With rapid industrialization and globalization, there has been a gradual shift from the traditional diet which is fiber-rich and minimal in fat to pre-packaged foods that are energy dense, and high in sugar and salt (2).

To improve the informed healthy food choices of consumers, there has arisen the need for food labelling which is a panel on packaged foods which contains information on the nutrients, their values, ingredients, expiry date and other relevant information. There is a low level of health consciousness among consumers which has resulted in failure to read and utilize information on food labels (3). Meanwhile, inadequate use of food labels can lead to poor dietary habits because most-prepackaged foods are high in saturated fat, salt and sugar which are not healthy (2).

Research have shown that less than half of those who use food labels do so regularly and only about 22% understand the information on the food labels despite having tertiary education (4). **N**utrition information on packaged food products do not influence some people's buying decisions and a fifth of the population in one study (20.4%) was ignorant of the impact of nutritional labelling on health (5).

Research also shows that large households which are common in low and middle-income countries have less willingness to read food labels (6). Poor knowledge, attitude and use of food label information could result in many other negative effects on consumers. Examples of such effects include purchase of expired pre-packaged food products or large quantities of foods which have a very short shelf-life leading to wastage or frequent consumption of high calorie food. This can lead to obesity, a known risk factor for many non-communicable diseases (3). Food poisoning and reaction to allergens in certain food products are also possible consequences and are causes of serious concern (7).

According to a report by the World Health Organization (WHO), 1.9 billion adults (39%) are overweight, of which 600 million (13%) are obese and deaths from these would increase by 25% in 2015 if it is unchecked. Meanwhile, emerging evidence has indicated that the obesity problem affects developing nations more than the developed ones with 75% of total deaths from NCDs occurring in developing countries (8).

Food labelling has been found to be a very important public health tool. Its aim is to provide consumers with information that potentially influences their purchasing decisions, thus preventing poor dietary lifestyles and reducing risk of NCDs. Food labels have been adopted by several countries as a means of measuring and ensuring food quality and safety (9,10).

Previous studies on food labels in African countries show a low level of knowledge and use of food labels. Amongst the literate, good nutritional knowledge to properly understand, interpret and act on food label information is not universally high, therefore, in Nigeria where general literacy levels are low, many people may not be able to access the information on food labels. (11, 12).

Nigeria has ethno-cultural, demographic and socioeconomic diversity and therefore offers a unique context for research but little is known about consumers' knowledge and utilization of labels on prepackaged foods. The report of a research conducted in Port Harcourt shows that the level of consumers' awareness and use of labels on packaged snacks is only 20.5%. Lagos State is a fast-growing mega city with the diets of many people rapidly shifting from a fiber-rich diet to a highly refined carbohydrate and fat diet but research on consumer knowledge and use of food labelling in this population is limited (13,14).

This study sought to determine the knowledge and utilization of food labels among consumers of prepackaged foods in urban and rural local governments areas in Lagos.

MATERIALS AND METHODS

The study design was descriptive cross-sectional. Adults (eighteen years and above) residing in Lagos constituted the study population. Children and visitors were excluded. The minimum sample size estimated using Cochran's formula and the 'p' taken as the proportion of those who utilized food labels in a previous study (81%),[5] was two hundred and thirty even (237). It was however increased to four hundred and fifty (450) to take care of non-response and improperly completed questionnaire.

Multistage sampling technique was employed to select the participants. Stratified

random sampling technique was used at the first stage, to select one urban and one rural local government areas (LGA) from the list of urban and rural LGAs. The urban and rural LGAs selected were Shomolu and Ikorodu, respectively. Two wards were selected from each LGA using simple random sampling methods (balloting) to obtain four wards. Simple random sampling technique was also used to select five streets from each ward to obtain twenty streets. All housing units on each street were included in the study. One household was selected from each housing unit and one adult was selected from each household by simple random sampling technique (balloting). All the households that were involved in the study had at least one adult residing there.

D**ata collection:** Data was collected from respondents using structured interviewer-administered questionnaire. Eight research assistants were successfully (They all passed the test conducted after the training) trained on administration of questionnaire and how to obtain informed consent; they collected data along with the investigators. Questionnaire was adapted from relevant similar studies and pretested in Mushin Local Government Area before administering it. The questionnaire consisted of three sections on socio-economic characteristics, knowledge of food label information and use of food label information.

Data analysis: Epi Info Version 7 was used for data coding, entry and analysis after verification. Proportions and frequencies were calculated and presented as tables. Chi-square test was used to test for association between socio-economic characteristics, knowledge and use of food label information. Knowledge was scored and categorized; the highest possible score was 21. Those who scored 8 (38%) and below had poor knowledge, between 9 (43%) and 13 (62%) had fair knowledge while between 14 (67%) and 21(100%) had good knowledge. Responses to three major questions (Reading food labels, frequency of reading food labels and how often the information is used to make decisions) on utilization of food labels were assessed and scored to determine the utilization of food labels. The minimum score was 0 while the total obtainable score was 6. Scores between 1 and 4 were categorized as poor use while between 5 and 6 were regarded as good use.

Ethical Approval: The study was conducted according to the Declaration of Helsinki's guidelines. Ethical clearance was sought and obtained from the Health Research and Ethics Committee of the Lagos University Teaching Hospital. Permission to conduct the study was granted by the local government authority while each participant gave informed written consent. Confidentiality was assured and maintained throughout the study.

RESULTS

Four hundred and twenty (420) questionnaires were completed and used for data analysis out of the four hundred and fifty questionnaires administered. The response rate was 93.3%. Most of the consumers, 398 (94.8%) were between the ages 18 – 40 years and had completed at least secondary education. Most of them, 304 (72.4%) were skilled workers or professionals.

Respondents' knowledge of food labels: Awareness of food labels was high, 394(93.8%), but knowledge was poor. Only 86(20.5%) understood the meaning of Recommended Dietary Allowances while 21 (5%) of them had 'good' level of knowledge about food label information. (Tables 1 and Figure 1)

Utilization of food label information: Only 122 (29.0%) of the consumers read food labels every time they buy a pre-packaged food product while the majority 373(88.8%) use food labels occasionally. The major reasons for using food labels among respondents were knowing the expiry and best before dates 241 (64.9%) and the ingredients, 85 (22.8%). Less than one third of the consumers, 123 (29.2%) had overall good use of food labels (Table 2 and Figure 2)

The major reasons for not reading food labels on every occasion or regularly were familiarity with the brands usually patronized, 143 (38.3%), lack of time, 93(24.9%) and interest, 74(19.8%). (Figure 3). The major difficulties encountered by those who read food labels, were small prints; 134 (31.9%), too technical terms; 121(28.8%), unfamiliar language; 87 (20.7%) confusing information; 69 (16.4%), too little information; 57(13.6%) poor layout of nutrition information; 48(11.4%).

There were statistically significant relationships between age and knowledge score ($p<0.05$) as well as estimated monthly income and utilization of food labels ($p<0.05$). Other socio-demographic variables were not significantly associated with knowledge and utilization of food labels. (Table 3, Table 4)

DISCUSSION

Although this study reports high level of awareness of food labels, relatively few possessed the facts and information required to translate such awareness into relevant action. While the respondents knew that sugar and cholesterol should be reduced in diet, much fewer knew about the various fatty acids and their differences. This might have a negative impact on healthy food choices. Indeed, the evidence is compelling that good nutrition knowledge provides support for food label use and a healthier dietary lifestyle (15).

There was a similar finding of poor knowledge about finer or more detailed nutritional facts among consumers in studies conducted in Malawi and South Africa (16, 17). A study among the Iranian women also showed that knowledge about the effect of excess salt was the highest while knowledge concerning effect of saturated fat was the lowest (18). In contrast, consumers in a United Kingdom population had more detailed knowledge such as expert recommendation on calorie intake (19). Low literacy levels in Africa compared to the Western countries and the fact that strict food labeling regulations are a recent phenomenon in developing countries could account for this gap in knowledge.

The prevalence of overall good knowledge of food labelling (5%) is similar to reports from Malawi and the Nutri-net Sante studies wherein only 7.0% and 7.5% of respondents respectively reported overall good knowledge of food labels (16, 17). In this study, knowledge of food labels increased with increasing age and this agrees with the report of another study in California which compared nutritional knowledge between older and younger adults and reported that older adults had better knowledge of nutrition (20). Ageing is associated with increased chronic illnesses and may impact on nutritional knowledge (21).

Although a high proportion of respondents in the present study read food labels occasionally, far less than half utilize food labels properly. The most important reason for utilization of food labels was to check the expiry dates followed by the determination of food ingredients. Other consumers in other studies also read food labels for similar reasons (22, 23). The most frequent circumstance in which majority of respondents read food labels was when buying certain kinds of products, a finding similar to that of other studies conducted in Gaborone, Botswana, where many respondents reported checking for nutrition information only when buying certain foods (24, 25).

This study shows that a significantly small proportion of respondents used labels with weight loss in view. However, weight loss was the main reason for utilization of food labels among half of the respondents in an Iranian study (5). This may imply that the adults in Lagos are not as conscious of weight control as other adults in a similar low- and middle-income country. Moreover, less than one quarter (24.7%) of respondents in this present study used nutrition information on labels of packaged foods to determine what to purchase. Health-related concerns (of which shedding weight is part) are a well-documented motivation for increased use of food labels but our study suggests that this relationship is not universal. The respondents in this study were more likely to read nutritional labels with concern around product quality such as expiry dates rather than health-related consequences mediated through nutritional content (26). This finding may also explain why labels were more often used in relation to buying certain food products, presumably those with which familiarity was less and manufacturer trust probably lower.

The ingredient list on the food labels was utilized by more than half of the respondents. This is similar to a study conducted in the United States but another study involving Irish respondents reported lower figures (23). Generally, the relatively high proportion using ingredient list is consistent with more concern for food quality issues rather than the direct health impact.

This study shows that the food constituents which respondents were most concerned about was energy (31.7%) and vitamin content (31.4%). This is similar to an Irish study where majority of the respondents (35%) were concerned about calorie content (23). However, another study conducted in Milan, Italy reported that vitamin and fat content were the most sought-after nutritional information as indicated by 40% of respondents (27). The findings also differed from reports from the Molise region of Italy where the most referred-to information was on fats and calories with 25.7% and 22.0%, respectively, reporting these (19). These varied preferences may be related to self-perception of weight and the need for healthier outcomes in view of the rise in obesity (28).

The three commonest reasons for not utilizing food label among the respondents included familiarity with the choice brand,

inadequate time to read labels and not having interest. Similar reasons such as limited time, no interest, lack of confidence in nutrition information on food products and lack of understanding of labels were reported in another study conducted in Iran. (11) The use of small prints was a common reason for not reading labels among older adults in another study (29). Too small prints, use of technical terms and unfamiliar language were ranked in order of priority as difficulties encountered by the consumers when utilizing food labels. A study among young adults in the United States showed that health literacy was a predictor of utilization of food labels and those in the low health literacy group had significantly lower utilization of food labels than the high health literacy group (23). The implication is that a policy that makes dietary guidelines on labels of packaged foods mandatory is effective for healthy eating only if consumers accurately understand and utilize food labels.

A higher income was significantly associated with good use of labels among the consumers. Gender and educational status were not significantly associated with utilization. This differs from findings in another study where education was significantly associated with good use of labels (29). Other factors associated with good use of label in the previous study were higher self-efficacy and older age (29). Some other studies (30, 31) indicated that utilization of food labels decreases with age and more among females than males. These variations in factors associated with label use in the different studies may reflect confounding by health literacy levels and the dominant sociocultural environment in different populations. They do reflect the fact that there is no universality in the drivers of utilization of nutrition label or, by extension, in the linearity of the relationship between nutrition label use and downstream health outcomes. The presence and impact of contextual factors specific to each environment and each population need to be understood in order to decipher the highly effective strategies for change.

CONCLUSION

This study concludes that despite the fact that awareness was high, levels of knowledge and utilization of food label information among adults in urban and rural areas of Lagos State is low. Less than one-third of the respondents had good use of information on food labels**.** The commonest difficulties encountered were too technical terms, too small fonts for printing and unfamiliar language in reading food labels. Public nutrition education on the importance of reading food labels and how to make proper use of them in purchase of food products is necessary in Lagos as are explicit efforts to raise the general population awareness of the links between long term health and better dietary habits.

Acknowledgements: The authors hereby acknowledge the Chairmen of Shomolu and Ikorodu Local Government Areas of Lagos State, for granting the permission to collect data.

Conflict of interest: The authors declare that there is no conflict of interest**.**

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Table 1: Respondents' knowledge of food label information

Knowledge of food labels information	Frequency (N= 420)	Percentage (%)
Awareness of food labels	394	93.8
Knowledge of food constituents that should be reduced		
Saturated fat	177	42.1
Sugar	264	62.9
Trans fat	106	25.2
Sodium	81	19.3
Cholesterol	266	63.3
Knowledge of food constituents that should not be reduced		
Iron	161	38.3
Polyunsaturated fat	41	9.7
Dietary fiber	97	23.1
Calcium	185	44.0
Monounsaturated fat	55	13.1
Understanding of the meaning of terms		
Recommended dietary allowance	86	20.5
Serving size	90	21.4
Daily Energy Requirement	53	12.6
Knowledge of health problems related to poor nutrition		
Diabetes mellitus	240	57.1
Obesity	221	52.6
Hypertension	132	31.4
Cardiovascular disease	123	29.3

Table 2: Consumer's utilization of food label information

Variables N=420	n	Freq (%)	LCL (%)	UCL (%)
Respondents who read food labels at least occasionally	373	88.8	85.6	92.0
Respondents who read food labels on every occasion	122	29.0	21.0	37.1
Respondents who don't use food labels at all	47	11.2	2.2	20.2
Reasons for reading among those who read food labels occasionally (n=373)				
Know expiry and best before dates	241	64.6	58.6	70.6
Identification of Ingredients	85	22.8	13.9	31.7
Certification from food control agencies	20	5.4	-4.5	15.2
Brand comparison, discounts, offerings	17	4.6	-5.4	14.5
Price	7	1.9	-8.2	11.9
Name and address of manufacturer	1	0.3	-9.9	10.4
Storage instructions	2	0.5	-9.6	10.7
Circumstances for reading of labels (n=373)				
When buying certain kinds of food products	212	56.8	50.2	63.5
When buying food products for the children(family)	98	26.3	17.6	35.0
When comparing products	106	28.4	19.8	37.0
When dealing with a health problem	115	30.8	22.4	39.3
When buying a product for the first time	151	40.5	32.7	48.3
When trying to lose weight	27	7.2	-2.5	17.0
Information sought for when reading food labels (n=373)				
Ingredients	197	52.8	45.8	59.8
Brand name	118	31.6	23.2	40.0
Expiry date	347	93.0	90.4	95.7
Manufacture date	218	58.4	51.9	65.0
Manufacturer	70	18.8	9.6	27.9
Net weight	61	16.4	7.1	25.6
Nutrient content	160	42.9	35.2	50.6
Storage condition	105	28.2	19.5	36.8
Instructions for use	120	32.2	23.8	40.5
Allergen information	44	11.8	2.3	21.3
NAFDAC number	205	55.0	48.1	61.8
Country of origin	73	19.6	10.5	28.7
Price	85	22.8	13.9	31.7
Health claim(s)	93	24.9	16.1	33.7
Serving Size	29	7.8	-2.0	17.5
Total energy and fat	50	13.4	4.0	22.8
Food constituents concerned about				
Energy	133	35.7	27.5	43.8
Protein	116	31.1	22.7	39.5
Sugar	94	25.2	16.4	34.0
Fats	**82**	**22.0**	**13.0**	**30.9**
Sodium	**21**	**5.6**	**-4.2**	**15.5**
Vitamins	**132**	**35.4**	**27.2**	**43.5**
Dietary fiber	**27**	**7.2**	**-2.5**	**17.0**
Cholesterol	**117**	**31.4**	**23.0**	**39.8**
Calcium	**60**	**16.1**	**6.8**	**25.4**

LCL: Lower confidence limit
UCL: Upper confidence limit

Table 3: Association between level of knowledge, utilization of food labels and socio-demographic characteristics.

	Level of Knowledge of Food Labels					
Variable	**Good**	**Fair**	**Poor**	**Total**	**X2**	**P**
Age range						
18-25	6 (3.53)	90(52.94)	74(43.53)	170(100)		
26-40	11 (6.47)	61(35.88)	98(57.65)	170(100)		0.049
41-60	4 (5.48)	31(42.47)	38(52.05)	73(100)	12.677	
>60	0(0.00)	5(71.4)	2(28.6)	7(100)		
Sex						
Male	9 (4.2)	90(42.3)	114(53.5)	213(100)		
Female	12 (5.8)	97(46.9)	98(47.3)	207(100)	1.813	0.404
Level of education						
No formal education	0 (0.0)	0 (0.0)	2 (100.0)	2(100)		
Primary	0(0.0)	6(30.0)	14 (70.0)	20(100)		
Secondary	4(2.5)	71(44.4)	85 (53.1)	160(100)		
Tertiary	17(7.1)	110(46.2)	111(46.6)	238(100)	10.68	0.099
	Utilization of Food Labels					
Monthly income	**Good**	**Poor**				
Below 10,000	23 (25)	69(75)		92 (100)		
10,000-20,000	20 (21.3)	74(78.7)		94 (100)		
20,001 – 50,000	36 (29.8)	85(70.2)		121 (100)		
50,001 – 100,000	28 (35.9)	50(64.1)		78 (100)		
Above 100,000	16(45.7)	19(54.3)		35 (100)	9.95	0.041
Sex						
Male	60 (28.2)	153(71.8)		213 (100)		
Female	63 (30.4)	144(69.6)		207 (100)	0.16	0.343
Level of education						
No formal education	0 (0.0)	2(100)		2 (100)		
Primary	4 (20.0)	16(80)		20 (100)		
Secondary	54 (33.8)	106(66.2)		160(100)		
Tertiary	65 (27.3)	173(72.7)		238 (100)	3.65	0.302

Figure 1: Respondents' Level of Knowledge about Food Labels

Figure 2: Respondents' Utilization of Food Labels

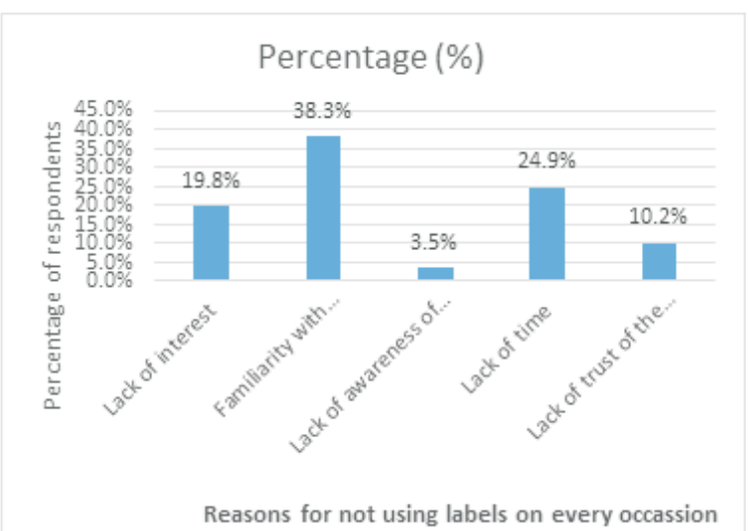

Figure 3: Respondents reasons for not using food labels every time they buy pre-packaged products