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Food labeling use by consumers in Arab countries: A scoping review

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Abstract:	<p>Non-Communicable Diseases (NCD) related to inadequate nutrition are prevalent in economically transitioning countries such as the Arab region. The westernized diet is recognized as a leading trend and the UN General Assembly is focused on the prevention and control of NCD. Due to the rapid transitions in diet and physical inactivity occurring in the Arab region, revising public health dietary strategies, guidelines, and policies to reduce the burden of NCD is needed. This article presents existing literature on food label use in the Arab region as a response to the problem. The primary objective was to locate, review, and summarize peer-reviewed studies on how and why consumers use food labels in Arab countries. An integrative review of the related literature was conducted with no delimiting time frames. The authors applied search strategies to eight academic databases which produced 32 peer-reviewed articles. Seventeen were removed due to inconsistent scope and focus. Awareness of and nutrition knowledge about food labeling emerged as a primary theme. Education, household income, and age were secondary themes and predictor variables. Nutrition food labels as a population-based strategy can influence individual behavior change and potentially improve population health. These outcomes depend on the consumer's ability to understand nutrition labels and properly apply information. Themed recommendations included standardization of food labeling policies, consumer education on food labeling, and public health efforts to develop a detailed understanding of regional populations prior to health promotion strategy development. Enabling informed food selection and reinforcing healthy dietary intake can help prevent NCD and support individual and population health.</p>

Food labeling use by consumers in Arab countries: A scoping review

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Compliance with Ethical Standards

Given the nature of this review, no ethical oversight was found to be necessary and, therefore, no institutional review board was acquired.

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Abstract

Non-Communicable Diseases (NCD) related to inadequate nutrition are prevalent in economically transitioning countries such as the Arab region. The westernized diet is recognized as a leading trend and the UN General Assembly is focused on the prevention and control of NCD. Due to the rapid transitions in diet and physical inactivity occurring in the Arab region, revising public health dietary strategies, guidelines, and policies to reduce the burden of NCD is needed. This article presents existing literature on food label use in the Arab region as a response to the problem. The primary objective was to locate, review, and summarize peer-reviewed studies on how and why consumers use food labels in Arab countries. An integrative review of the related literature was conducted with no delimiting time frames. The authors applied search strategies to eight academic databases which produced 32 peer-reviewed articles. Seventeen were removed due to inconsistent scope and focus. Awareness of and nutrition knowledge about food labeling emerged as a primary theme. Education, household income, and age were secondary themes and predictor variables. Nutrition food labels as a population-based strategy can influence individual behavior change and potentially improve population health. These outcomes depend on the consumer's ability to understand nutrition labels and properly apply information. Themed recommendations included standardization of food labeling policies, consumer education on food labeling, and public health efforts to develop a detailed understanding of regional populations prior to health promotion strategy development. Enabling informed food selection and reinforcing healthy dietary intake can help prevent NCD and support individual and population health.

Keywords

Food label use; Arab consumer; Arab countries; Public health nutrition; Nutrition education

Nutrition Food labeling use by consumers in Arab countries: A scoping review

Introduction

The high prevalence of Non-Communicable Diseases (NCD) related to inadequate nutrition have caused crucial health challenges across the globe. Today, NCDs are considered a trend in economically transitioning countries such as Arab region (Sibai et al., 2017). Thus, the burden of NCD, especially cardiovascular disease (CVD), cancer, diabetes, and obesity, continues to escalate in the Arab world (Alwan, 2014). Three of top 20 countries are at prevalence risk of obesity (Jabbour, 2013) and three of top 10 countries worldwide burdened with high prevalence of diabetes (Abuyassin & Laher, 2016) are Arab countries. Prevalence of NCD also became a dominant predictor for premature death and disability in middle- and high-income Arab regions (Rahim et al., 2014), where ischemic heart disease is the leading cause of death contributing to 14.3% in 2010 (Mokdad et al., 2014). The burden of NCD doesn't only affect the population mortality and disability, but it also burdens the economic and health status which is referred as the double disease burden (Jabbour, 2013).

The epidemic rise of nutrition-related diseases is due a nutrition transition marked by an increase consumption of empty calories dense food and poorly nutrition food known as the 'Westernized diet'. The Arab region is geopolitically defined by the League of Arab States and has similar language which spread across two continents from north Africa to western Asia and contains 22 member countries: Algeria, Egypt, Bahrain, Comoros, Djibouti, Iraq, Jordan, Saudi Arabia, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, occupied Palestinian territory, Qatar, Yemen, Somalia, Sudan, Syria, Tunisia, and the United Arab Emirates (Aboul-Enein, Bernstein, & Neary, 2017; Blair, Grivna, & Sharif, 2014; Mokdad et al., 2014). The westernized diet is recognized as one of the leading yet unfavorable dietary trends in the Arab region as more consumers eat ready-packaged and convenience foods

processed with refined sugar, animal fat, salt, and red meat and less of dietary fiber, fruits, vegetables and unrefined whole grains (Aboul-Enein et al., 2017).

International action against NCD is gaining momentum following the political declaration of the UN General Assembly focused on the prevention and control of NCD in 2011. The subsequent monitoring framework has identified evidence-based interventions for prevention and treatment. Implementation of such a framework will require political commitment, multisectoral action, strengthened health systems, and continuous monitoring and assessment of progress. Hence, enforcing policy commitments is perceived as a considerable challenge in the Arab region (Rahim et al., 2014). As Arab governments established different policies and developed food-based dietary guidelines to address the high prevalence of NCD, an overall weak implementation or evaluation is reported (Coats, Bernstein, Dodge, Bechar, & Aboul-Enein, 2019; Musaiger, Hassan, & Obeid, 2011). Due to the rapid transitions in diet and physical inactivity occurring in the Arab region, revising public health dietary strategies, guidelines, and policies to reduce the burden of NCD is urgently needed. According to the national political government policies a strong call for multi-stakeholder collaboration to determine the burden imposed by NCDs as well as their root causes. One of the policies of Middle-income countries government is to increase the consumption of fruit and vegetable as a dietary action for NCD prevention and other policy is by adopting food labelling on pre-packaged products and beverages as a suitable practice to tackle the rise of nutrition-related diseases (Lachat et al., 2013).

Nutrition food labelling is a standard nutrition guideline set by the Codex Alimentarius Commission, established jointly by the Food and Agriculture Organization (FAO) and the World Health Organization (WHO) (Codex Alimentarius Commission, 2013). Nutrition food labeling provides consumers with information on packaged foods such as serving size, servings per container, and nutrition facts similar to caloric content per serving, total protein,

carbohydrates, sugars, fat, cholesterol, and sodium. This information is indicated on the food item to benefit consumers making food choices (Viola, Bianchi, Croce, & Ceretti, 2016). In the Arab region, food labeling regulation is mandatory for less than half of the countries (47%) and voluntary for only 20% (Mandle, Tugendhaft, Michalow, & Hofman, 2015). Food labeling is considered a population-based approach to health education that enables consumers to make informed decisions and adopt a healthy diet (Hassan & Dimassi, 2017). A recent systematic review showed a positive affect on consumers dietary intakes when self reporting of food label use; as they reduced their energy intake by 6.6%, total fat intake by 10.6%, other unhealthy foods by 13.0%. It reinforces the fact that food label is a way to influence consumers purchasing decisions and ability to differentiate between healthy and unhealthy foods (Anastasiou, Miller, & Dickinson, 2019).

Considering the NCD epidemic related to unhealthy lifestyle and poor dietary intake in Arab countries, this research paper screened the existing literature on the use of food labels by consumers in the Arab region. Thus, the primary objective for this article was to locate, review, and summarize peer-reviewed studies that address how and why consumers use food labels in Arab countries. A discussion of food label effectiveness as a potential tool to promote healthy food choices and hence contributing to NCD reduction in these countries is included. Finally, findings of this study will provide evidences to set adequate recommendations at both individual (consumer) and/or public health (government) levels to promote the use of food labels by Arab consumers.

Methods

An integrative review of the literature was carried out prior to March 2019. No time frame was set during the search in order to obtain all relevant published literature data and thus develop a comprehensive understanding on the evolution of Arab consumer behavior

toward food labels. Relevant articles were identified by applying search strategies to eight academic electronic databases: PubMed, Scopus, EBSCOhost, SpringerLink, Taylor & Francis, Wiley Online, google scholar, and ScienceDirect. The Search terms, phrases, and key words included in the final search syntax were - “nutrition”; “nutritional”; “labelling”; “labelling”; “label”; “information”; “package”; “food”; “Consumer behavior”; “behaviour” AND “Algeria”; “Egypt”; “Bahrain”; “Comoros”; “Djibouti”; “Iraq”; “Jordan”; “Saudi Arabia”; “Kuwait”; “Lebanon”; “Libya”; “Mauritania”; “Morocco”; “Oman”; “Occupied Palestinian territories”; “Qatar”; “Yemen”; “Somalia”; “Sudan”; “Syria”; “Tunisia”; “the United Arab Emirates”. Languages used for search were English, Arabic, and French as they are the potential languages used for research publication related to Arab countries. All retrieved titles, abstracts, and articles were screened for relevance to the topic. References from retrieved articles were reviewed to identify additional publications.

Eligibility Criteria

Eligible published literature was defined using the following inclusion parameters - 1.) Peer-reviewed publications prior to March 2019; 2.) Adult consumers; 3.) Articles discussing food label use by Arab consumers; and 4.) Types of articles such as brief reports, commentaries, communications, qualitative or quantitative studies. Articles discussing economic marketing, food production safety, food labeling regulations and legislation, and food composition analysis were excluded. Grey literature was also excluded in this review.

Results

The literature identification process produced 32 articles that met eligibility. Following the literature review process, 17 articles were removed from the sample as their focus was not on Arab consumers toward food label use, which produced a final sample ($n=15$). The sample

was then configured by author, publication date, study design, sample size, data collection method, results, and author recommendations (see Table 1). Eleven of the 15 articles in our sample were studies published in the last 5 years, all but one was published within the last 10 years. All but three articles were published in the KSA, the UAE, or Lebanon; 14 of the 22 countries included in our search have not produced a study on food label use among consumers in Arab countries. Variation among study type and data collection methods was minimal; descriptive or cross-sectional designs and questionnaires or interviews represented the majorities.

Within our peer-reviewed sample, awareness of and nutrition knowledge about food labeling emerged as a common theme among results. Secondary to this theme was education level and age; as both values increase, awareness of and knowledge about food labeling appears to increase across the sample. Income presented as a minor theme as did position of the food labels and the amount of information contained as potential predictors of if labels are considered by consumers.

Primary author recommendations were developed in conjunction with results. Considerations for policy at the governmental and regional levels and increased consumer nutrition education were the primary recommendations within the sample. Redesign and/or standardization of food labels were recommended by one third of the sample author groups. Calls for consumer education programs that lead to increase in awareness of food labels, knowledge and use increase, and subsequent behavior change were also found in the sample. Curiously, despite the apparent lack of scholarly productivity for food label use in this region, only one author groups recommended more research on a larger scale and two others recommended parallel lines of research.

Discussion

Nutrition food labels as a population-based strategy can potentially influence individual behavior change and population health. These influences depend on the consumer's ability to understand nutrition labels and use them properly. The importance of food label policies and regulations in most Arab countries is well presented in the literature. Although a significant majority of articles within our sample are contemporary, there appears to be a significant gap between available information and expected outcomes related to food label policy, nutrition knowledge and understanding of target populations, and health behaviors. In fact, relevant studies were identified for only eight countries among the 22 Arab countries in our study. In addition, availability of information is rarely considered a final step. What health information is made available, how it is consumed (or if it's consumed at all), and why are factors that often determine the success or failure of a health education, health promotion, or public health effort.

A common theme throughout our sample was awareness of food labels. Consensus indicates target populations are aware of food labeling information, but we cannot say with confidence that the importance of label information is recognized. To further complicate this issue, studies have highlighted the misleading and sometimes predatory nature of food labeling that targets populations who may understand the need to review food label information or nutritional data typically found on the other side of packaged products yet lack the requisite understanding (Butler & Vossler, 2018; Sutterlin & Siegrist, 2015). This suggests awareness is necessary yet inadequate as a response to this issue. We agree with this primary theme in our sample: Awareness of the importance of food label information is necessary for effectiveness. However, awareness as a standalone campaign or policy directive would be insufficient to produce or increase health eating habits.

Consumer education on food labeling was a primary recommendation within our sample. However, Cannoosamy, Pugo-Gunsam, and Jeewon (2014) suggest public health

educators develop a detailed understanding of regional populations before developing educational strategies. Their research suggests age, education, household income, and family size all present as statistically significant variables associated with food label knowledge and confidence. Research-based evidence suggests knowledge and attitude of consumers towards food label were positively correlated with education. More educated consumers are usually more involved in health and nutrition education practices viewed as beneficial in place of risk avoidance. However, many consumers feel confident they understand how to read labels and prefer this practice over relying on their own nutrition knowledge. A literature review of 28 studies reported a significant association between nutrition knowledge and food label use and 18 studies found consumers with nutritional knowledge were more likely to understand nutrition labels better than those with lower levels of nutritional knowledge (Miller & Cassady, 2015). It was also evident that even though consumers are aware of the importance of reading food label in adapting healthier dietary habits they still gave more attention and importance to manufacturing date, expiration date, and content of the package. This suggests nutrition knowledge provides a major role related to efficacy and frequency of food label use versus understanding the information on food labels while shopping (Miller & Cassady, 2015).

Increase in awareness of food label knowledge and use and subsequent behavior change were also found in the sample. Correct use of food labelling would increase the amount of people selecting a healthier food product by approximately 18% and could decrease calorie intake/choice by about 3.5% (Cecchini & Warin, 2016). Walsh et al. (2017) demonstrated that a specific change in health status triggers motivation towards selecting specific healthy food leading to dietary behavior change, e.g. salt intake reduction by 65% in Lebanese hypertensive patients. A Korean study also found discrepancies between consumer knowledge of food label information and confidence to apply that knowledge. Lee et al.

(2014) agree that awareness and nutrition knowledge represent a starting point in the consumer education effort, however, they highlight experience as a significant influencing factor. Public health education efforts should go beyond knowledge transfer; understanding food label information should be evaluated through application. Although individual dietary choices and behaviors represent a key element in addressing NCDs such as obesity and CVD the recommended consumer nutrition education might best be initiated at the policy level.

One third of our sample recommended standardization of food label practices. We see two primary benefits of this practice: Simplification of health education and health promotion efforts directed at the consumer population and increased health and consumer literacy at the point of sale contact between individuals and products. A primary example of standardization is *front-of-package nutrition labeling* or the placement of key nutritional data on the same label side as the product name and advertisement information. A recent U.S. study comparing traditional and front-of-package nutrition labeling found a significant majority of shoppers found nutrition information on the front side of a product versus the traditional nutrition facts label when both were present and educational signage was used (Graham, Heidrick, & Hodgins, 2015). Gracia and de-Magistris (2016) found that labeling preferences matter to food selection. Their study asked consumers to rank label choices based on what information was provided and where. Although strong preferences emerged, findings were heterogeneous which suggests preferences among specific target populations need to be understood prior to standardization efforts.

Considerations and recommendations for food label policy developments and reform were sub-findings in our sample. From a public health point of view, there is near consensus that nutrition information is too complex. The multifaceted considerations for product information, legal information, and regional requirements make nutrition labeling a difficult process to relay information to target audiences in a manner that is understandable and not

overshadowed by product marketing dynamics. Guthrie, Mancino, and Lin (2015) suggest the typical approach to educating consumers on dietary choices – providing information about why and how to choose a healthy diet – is insufficient to producing meaningful and lasting behavior changes. The manner in which information is developed and provided is often hidden (back label) or too complex, misleading (e.g. “all natural”), or insufficient to meet readability levels of a target population. Policy reform that addresses factors that work against basic nutrition label understanding should be addressed at policy levels.

Conclusion

Our study is (to our knowledge) the first review on food labeling use in the Arab countries. This research emerged from an urgent need to providing insight and analysis on the current situation and effectiveness of food label use by Arab consumers to reduce NCD related to unhealthy dietary behaviors. Although, the sample was smaller than anticipated ($n=15$), primary findings confirm recommendations about nutrition education and awareness interventions are needed to improve food label literacy and frequency of use among Arab consumers to focus on healthy eating and NCD comorbidities. Thus, our recommendation to stakeholders involved in public health is to actively participate consumer health programs about nutrition awareness. Furthermore, reviewing food labels in a more attractive design could provide more consistent, understandable, and usable consumer information. Enabling food selection and reinforcing healthy dietary intake can be engineered and food labeling that follows research-based guidelines is part of the solution. Finally, in addition to the insufficient body of research identified on food label use among Arab consumers, real world impact of such information on healthy food choices remains contentious. Thus, further evaluation is needed to track public health information and education interventions related to nutrition labels within Arab consumer populations.

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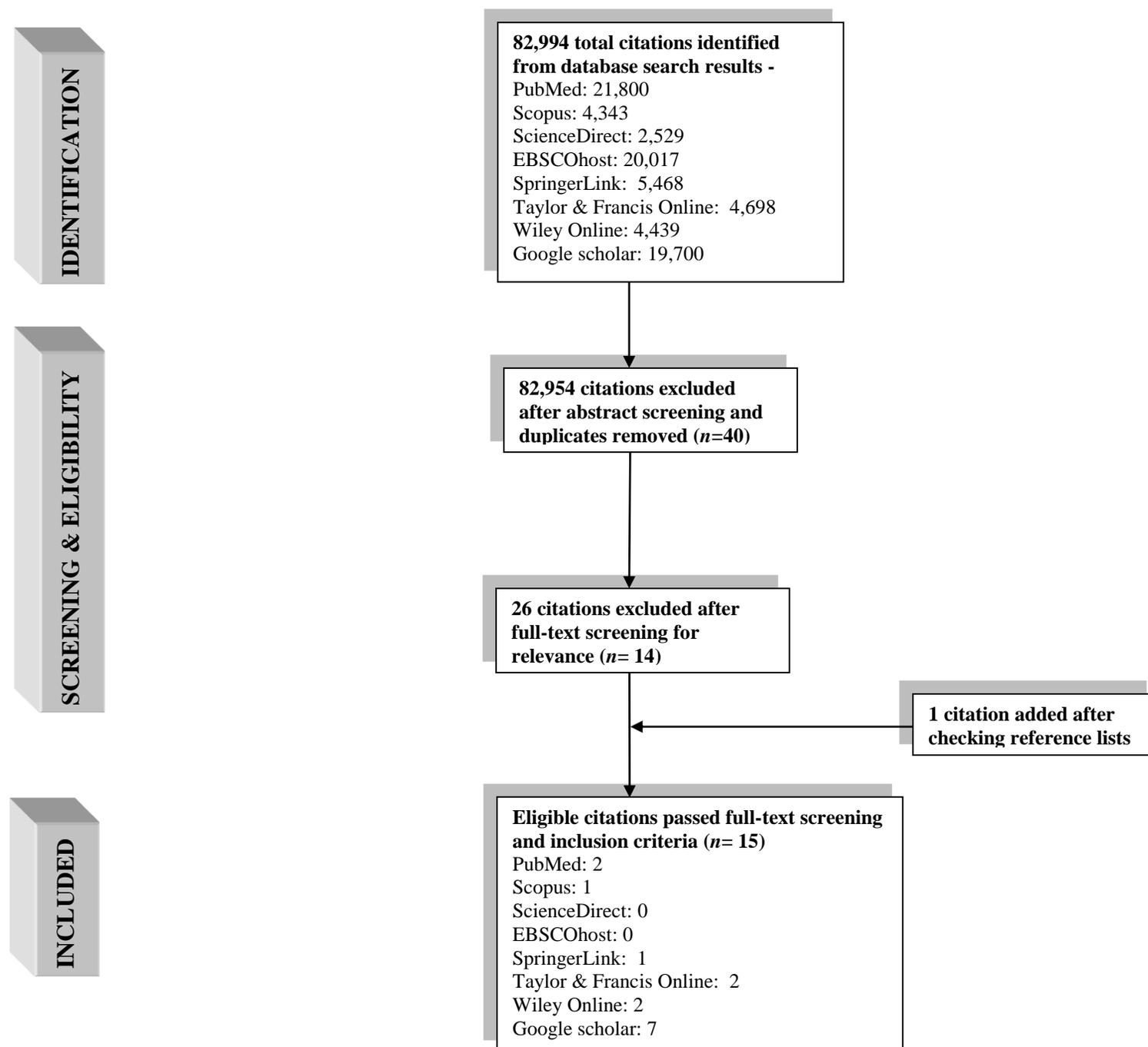
Figure 1. Flow Diagram of Literature Search Process.

Table 1. Food label use in Arab countries (n=15)

Authors and Year	Country	Study Design	Sample Size / sampling technique	Data collection	Main results	Recommendations
(Bakr & Ayinde, 2013)	KSA (Makkah)	Cross-sectional Descriptive study	100 respondents Random sample	Questionnaire	Lack of awareness and non-availability of labelling of either genetically modified food (GM) or traditional foods. Consumers have no knowledge or were not aware of existence of GM foods and have been consuming GM foods without their knowledge.	Future research on a large scale with substantial respondents selected across Saudi Arabia.
(Sachithananthan, 2017)	KSA (Abha)	Cross-sectional	407 subjects Random sample	Questionnaire online in Google forms.	Majority of participant had awareness about the presence of 'Food Preservatives' and 'Flavoring Agents' in the packed foods that they buy. A majority of the subjects within male gender knew how to read the labels on the packaged food (42.9%), whereas only 31.6% of females within female gender were able to read the labels. Of the total, around 25.1% of the subjects read the labels sometimes of which female constituted 18.7%. Education, sex and income levels play an important part in purchasing attitudes in the use of packaged food.	Knowledge about packaged food should be popularized. awareness on reading food labels before purchasing packaged food is important and is the need of the hour.
(Kamel & Al Otaibi, 2018)	KSA (Al-Ahsa)	Descriptive design study	302 participants random sample	Dietary interview questionnaires	Significant positive correlation was found between participant's education level and hearing about hydrogenated oil (HO) ($r=0.69$, $p> 0.01$) as well as reading the food label ($r=0.87$, $p> 0.01$). Highly negative correlation between participant income and their awareness about HO ($r=-0.8$, $p> 0.01$), reading the food label ($r=-0.76$, $p> 0.01$) and low price of hydrogenated fat ($r=-0.91$, $p> 0.01$).	More attention should be paid to reevaluate the food label legalization. Health education programs about trans-fats sources and related disease are strongly recommended.

					Majority of participants have no information about unhealthy effect of hydrogenated oils nor read the food labels	
(Washi, 2001)	KSA (Riyadh)	Descriptive study	400 consumers random sample	Interview questionnaire	Consumers survey indicated ignorance of the importance of information on the label such as nutrient content, serving size, special characteristics, health claims, special use, and health warning	Provision of nutrition education on nutritional aspects of food labeling among consumers and encouraging food products manufacturers to provide more nutrition information on food labels
(Muhummad et al., 2016)	UAE	Descriptive study	300 respondents random sample	Questionnaire	-study finds that awareness about organic food is influenced by more relevant factors such as gender, nationality, and education as well as income, occupation status, and age	Future studies may also consider changes of consumers' behavior in response to expanding use of information through advanced information technology such as social media.
(Radwan et al., 2017)	UAE (Sharjah and Dubai)	Quantitative A cross sectional study	2020 participants clustered sample	Questionnaire	Most participants estimated correctly the energy requirements for moderately active men and women but tended to underestimate energy requirements for inactive adults. Participants expressed a positive attitude towards menu labeling in dine in restaurants; a majority viewed it as very or somewhat useful, reported being more likely to eat in a restaurant with menu labeled restaurant.	Given that there is an increasing frequency of restaurant visitors in UAE mandating calorie posting in menus, as well as fast food restaurants may be a useful policy tool for promoting appropriate energy, intake, to help consumers make food choices in restaurants, contributing to lower rates of obesity.

(Basarir and Sherif, 2012)	UAE (Abu Dhabi, Dubai and Sharjah)	Descriptive study	500 respondents Random sample	face-to-face interviews	<p>-the majority of respondents read the information provided on food labels. In addition to that, more than half of them would like to see labeled food items on stores" shelves.</p> <p>-The results of regression analysis indicated that expatriates were reading food labels more frequently than the UAE nationals.</p> <p>-Emirati respondents and those who have larger household read labels less frequently, on the other hand, those who have more children under the age of 18 read labels more frequently.</p> <p>-the older, more educated, and those who have more children under age of 18 read food labels more frequently. On the other hand, most of the respondents want the food items to be labeled mandatorily in UAE.</p>	<p>One of the suggestions to policy makers provide education and awareness programs for UAE nationals to read the entire information written on the label.</p> <p>Standardization of the way that labeling should be made has to be set by the government and then food producers/ processors should be educated about its importance and implementation</p>
(Washi, 2012)	UAE (Al-Ain)	Descriptive cross-sectional study	1200 subjects random sample	questionnaire	<p>-Significant relationships were found between genders; level of education and looking for special characteristics on the food label.</p> <p>-More attention was given to the special characteristics stated such as low calories and low cholesterol.</p> <p>-Although production and expiry dates are mandatory items on all food labels; the study reflected the increased importance given by the consumers to the necessity of including them on the food label.</p> <p>-Significant correlations were found between single items on the food label and some of the demographic variables.</p>	<p>-further studies on the impact of different forms of labeling on the consumer's ability to make use of the information on them. As well, an evaluation for the existing nutrition awareness programs and specifying needs for extension programs in nutrition and food label are also needed</p>
(Muhammad et al., 2010)	UAE (Al-Ain)	Descriptive study	485 household heads	Field survey Random sample	<p>The Urdu/Hindi-speaking population cared the most for food prices for reasons that probably had to do with lower education levels and low incomes.</p>	<p>UAE government needs to place more emphasis on launching consumer-awareness campaigns via different media sources since</p>

					<p>- Fat, cholesterol and sugar in food were the main three food safety concerns in varying degrees depending upon the type of the ethnic groups. For Emiratis and the Arab-speaking and English-speaking groups, food poisoning was first</p> <p>-The respondents' education levels and their ethnicity were the major determinants of their perception and attitude toward major food safety concerns and practices</p>	each ethnic group perceived the worthiness of food-safety information differently
(Walsh et al., 2017)	Lebanon (Medical Centre, American University of Beirut)	Cross-sectional study	115 patients In cardiac care unit Random sample	Questionnaire	<p>Common knowledge gaps identified are that few (19%) can correctly identify the recommended maximal salt intake and only 37% identified processed foods as the main source of salt/sodium in the Lebanese diet.</p> <p>Frequency of using food labels to consider salt content and purchasing food with no added salt was low, whilst frequency of adding salt at the table was high.</p>	The negative behavioral practices and factors associated with salt-related behavior identified can be utilized to design salt-reduction interventions for high-risk patients in Lebanon, where effective salt reduction is likely to significantly impact on public health.
(Nasreddine et al., 2014)	Lebanon (Beirut)	Cross-sectional study	442 subjects systematic random sampling	Questionnaire	<p>-two-thirds of the study participants reported to regularly check food content labels, only a third reported checking specifically for salt content. More alarmingly, greater than half of the study population reported that the salt content on the label doesn't affect their decision to purchase the product.</p> <p>The low proportion of participants reporting to check salt-related label content may be an artifact of the consumer's difficulty in using and interpreting labeled sodium information.</p> <p>- individuals who were aware of the relationship between salt and sodium were more likely to modify their food purchase decision based on salt label content.</p>	the need for culture-specific education and awareness campaigns on salt, its dietary contributors and its association with health.

(Hassan & Dimassi, 2017)	Lebanon (Beirut, Baabda, Byblos, Tripoli and Koura)	Cross-sectional study	748 supermarket shoppers random sample	Questionnaire	<p>-The most common reason for not reading labels was lack of time (34.9%) followed by no need to do so (15.1%), no knowledge how to read them (9.8%) and too small labels (8.0%)</p> <p>-About 44.4% of participants reported that reading food labels is very important,</p> <p>-In terms of the nutrition information on food labels, 19.3% of the participants thought that it is too much, and 54.8% reported that it is enough. In addition, 35.7% of the participants answered that it is easy to understand, 42.2% thought that it is neither easy nor difficult to understand and 14% reported that it is difficult to understand.</p> <p>-On the other hand, 60.3% of the participants agreed on the fact that food labels helped people in changing their eating habits and 59.8% of them reported that health and nutrition claims affect their choices of selecting a certain product.</p> <p>-people who lived with a partner or with children, those with higher educational levels and income, and women showed the greatest information search behavior for labels</p> <p>-This study showed that there was strong association between demographic information and the self-reported knowledge and usage of food labels</p>	the high need for nutrition education and groceries
(Nagi, 2012)	Iraq (Baghdad)	Descriptive design study	200 students college Random sample	Questionnaire	<p>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</p> <p>The finding of the study was indicated that the large number of students had enough knowledge about nutritional facts labeling</p>	Encouragement of all companies and manufacturers to play an important role to provide the canned nutritional products information labels that

						<p>truthful and not misleads consumers.</p> <p>Subordination of the local canned food products for quality control.</p> <p>Establishing a nutritional fact labeling program toward smart shopping for students at all universities in Iraq.</p> <p>Spreading the nutritional information toward food labeling through the media.</p>
(Hamelin et al., 2013)	Morocco (Fes, Meknes, Casablanca, Rabat, and Ifrane)	Cross sectional study	355 subjects convenience sampling method		<p>Lack or unreliability of information is a deteriorating factor to the ethical market in Morocco.</p> <p>-Lack of information is a main source of confusion to the population. This explains Moroccans' skepticism toward ethical food.</p> <p>-the willingness to buy is not always translated into actual buying because of reasons such as lack of trust toward ethical claims made by firms</p>	<p>it is becoming necessary to educate consumers about the importance of ethics.</p> <p>Therefore, education about the importance of ethics should be emphasized to eliminate such tradeoffs and make ethics a norm in Moroccan society.</p>
(Al-Khamees, 2018)	Kuwait (Kuwait)	Cross-sectional and descriptive research approach	1000 respondents convenience sample	Questionnaire	<p>-Students were rather more likely to read food label information when buying an item for the first time.</p> <p>Majority of students thought food label information was useful and always has an influence on food awareness,</p> <p>The majority thought that food label information is very important and must be put on all product</p>	There is obviously scope for redesign of labels and further education in their use.

					<p>-students agreed that food label information helps in choosing the best product,</p> <p>-The main reason (40.1%) given for failing to read food label information was time shortage, while 25.2% did not read it because it was not clear to them, and 34.7% because they do not understand food label information.</p> <p>-Students in later years of education were significantly more likely to read labels than were those in earlier years</p>	
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