Awareness and Application of Food Labels Among Adults in GCC Countries: A Systematic Review

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Abstract

To explore consumer understanding and usage of food labelling, a systematic review was conducted from 2012 to 2023 in the Gulf Cooperation Council (GCC) countries: Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates. Food labelling is an informative tool on packaged foods that provides consumers with information, such as serving size, servings per container, ingredients, allergens, and nutrient content (total carbohydrates, fat, protein, sugar and sodium). This review focused only on nutritional value of food. Sixteen papers were identified that reported on consumer understanding or usage of food labelling, with the majority having been conducted in Saudi Arabia. Only four studies were judged to be of high quality (e.g., representative sample size, validated method), with eight of sixteen studies reported that consumers were generally aware of food labelling information. Consumers with a higher level of education, high income individuals, older people and females demonstrated more awareness and usage of food labelling across studies conducted in Saudi Arabia. Cultural and socioeconomic factors such as dietary restrictions, health perspective and price influence the dietary decisions of Arab consumers and tailored nutritional education and awareness interventions are required to improve food label literacy and healthy diet choices.

Keywords: food labelling, consumers, understanding and use/usage

1. Introduction

Creating an encouraging environment that aids consumers in making healthy choices is a significant principle in health promotion. Food labelling is an informative tool on packaged foods that provides consumers with information, such as serving size, servings per container, ingredients, allergens, and nutrient content (total carbohydrates, fat, protein, sugar and sodium) (Benajiba et al., 2020). Food labelling is an example of a population-based approach which aims to make the food choice environment more conducive to healthy choices, enabling people to choose food products based on nutritional content. Additionally, the provision of on-pack nutrition information supports the goal of healthy choice and informs consumers about the quality of food (Grunert and Wills, 2007, Riaz et al., 2022) .(Cowburn and Stockley, 2005). Another systematic review conducted in 2019 showed a positive impact on consumers' dietary intake when self-reporting food label use (Nkhoma et al., 2023). In many countries experiencing a population-wide shift from a traditional diet to more contemporary patterns of food consumption, labelling regulations have been adopted (El-Sabban, 2020). The majority of global policy on food labelling, such as in Europe, the USA, Australia and New Zealand, Asia, Africa, and Latin America, has also implemented labelling regulations (Mandle et al., 2015). In the Gulf Cooperation Countries (GCC), all states have made some efforts with regards to health promotion policies (Samara et al., 2019). The GCC adopted the Gulf Standards Organisation (GSO), which requires that food labels should specify the main nutrient content of foods, such as total carbohydrates, fat, protein, dietary fibre, and energy in the form of calorie content. The importance of food labelling policies and regulations in most Arab countries is well presented in the literature. For example, a study

conducted in Saudi Arabia found that implementing mandatory nutrition labelling on packaged foods led to increased awareness and understanding of nutrition information among consumers. This resulted in healthier food choices and improved dietary habits, ultimately contributing to a reduction in the prevalence of chronic diseases, such as obesity and diabetes, among the population (Alassaf et al., 2020). However, knowledge and usage of food labelling among individuals is unknown. Therefore, this review aimed to determine food labelling knowledge, attitudes, and practices among adult consumers in the GCC.

2. Methods

2.1. Literature and search terms

A systematic review was undertaken in line with the Preferred Reporting Items for Systematic Review (PRISMA) guidelines. A comprehensive search was conducted using four different electronic databases: PubMed, Web of Science, Embase, and Global Health. The search strategy was applied to each database and included "knowledge" OR "awareness" AND "food labelling' OR "nutrition facts" AND "Gulf Countries". An additional search was conducted through Google Scholar to ensure completeness of the search. Food labelling was defined as the nutrition information panel and any associated information, such as Guideline Daily Amounts (GDAs), provided on the packaging (Nations, 2023).

2.2. Selection criteria

Inclusion criteria was as follows: adults aged >18 years, data reported from 2012 to 2023 in the Gulf Cooperation Council (GCC) countries: Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates, studies that assessed the knowledge, practices, attitudes, and understanding towards the use of food labelling, studies that assessed consumers' nutritional knowledge and determined the effect of demographic characteristics and lifestyle factors in relation to nutritional knowledge and labelling usage, studies that assessed consumer awareness of food labels and their influence on decisions to buy or order food items, and studies that assessed the relationship between the use of food labelling and health behaviours. In addition, studies reporting any type of relevant study design, process or outcomes were considered for inclusion. Studies were excluded if they were based on consumers <18 years old, duplicated publications from the same study that did not provide new data, or were published prior to January 2012.

2.3. Quality assessment

In order to assess study quality, the Newcastle-Ottawa Scale (NOS) was used which is a risk of bias assessment tool recommended by the Cochrane Collaboration for observational studies (Higgins, 2011). The scale was adapted from cohort studies to provide a quality assessment for non-randomized or observational studies (GA Wells, 2020). A maximum of 10 points was assigned based on the method of sampling (e.g., representative), e(two points), justification of the sample size (one point), reported response rates and reported characteristics of non-responders and responders (two points), use of validated methods to measure knowledge of food labelling (two points), knowledge presented by social demographic status and/or adjusted for gender (two points), and the methods of statistical analysis reported (one point).

3. Results and Discussion

3.1. Study Identification

Figure 1 presents the PRISMA flow diagram of the study selection process. A total of 4500 papers were identified in the initial search, 3500 duplicates were removed, 1000 title and abstracts were reviewed, and 163 full text articles were reviewed. Of these, 16 papers met the inclusion criteria.

Figure 1 PRISMA flowchart for study selection.

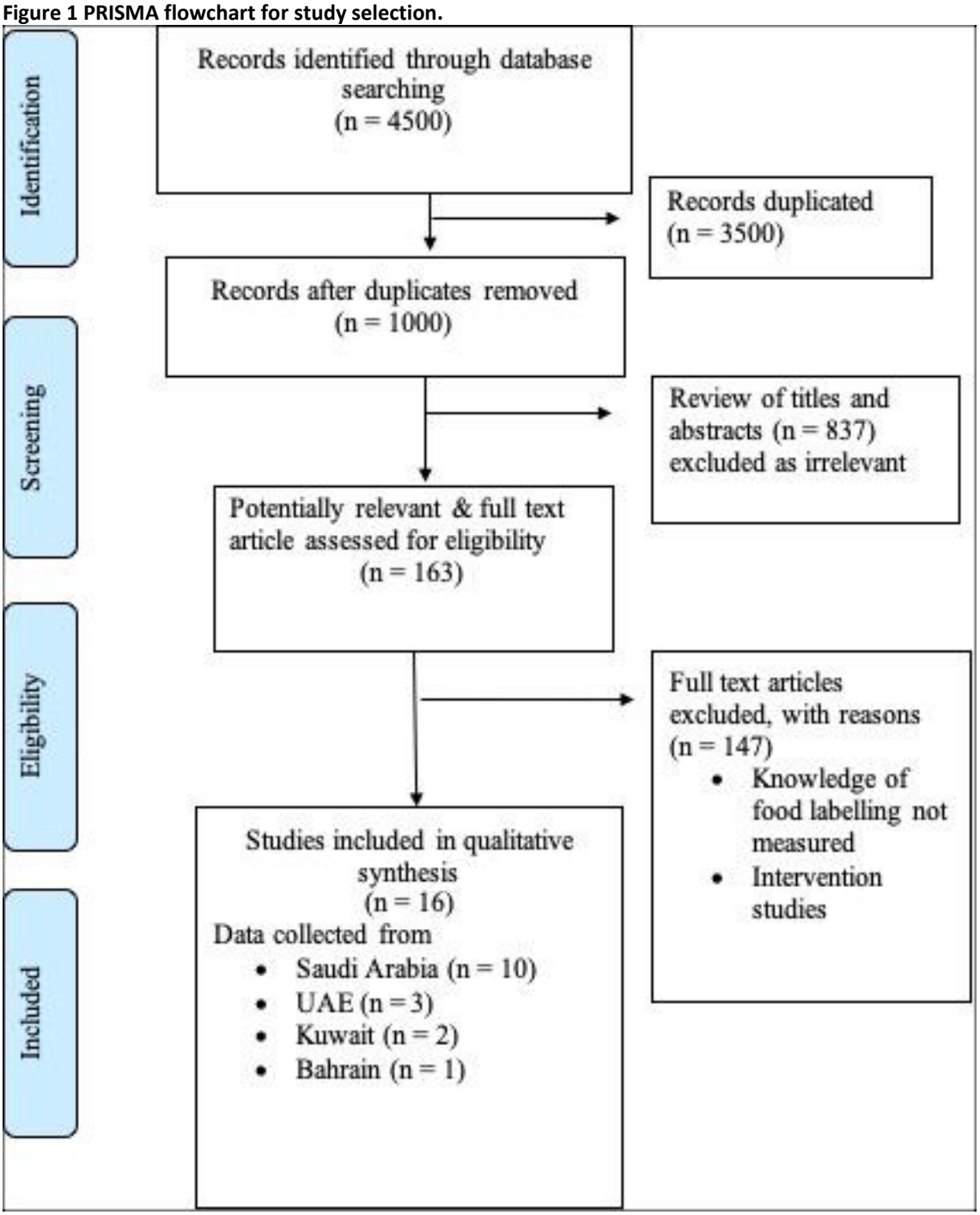

Table 1 shows a summary of the general characteristics of the included studies. Ten studies were conducted in Saudi Arabia (KSA) (Arfaoui et al., 2021, AlShehri and AlMarzooqi, 2022, Binobead et al., 2022, Riaz et al., 2022, Jalloun and Youssef, 2020, Alkhaldy et al., 2020, TURKISTANI and SAATY, 2020, Alkhathami et al., 2021, Alassaf et al., 2020, Al-Barqi et al., 2020), three studies were based in United Arab Emirates (UAE) (Washi, 2012, Basarir and Sherif, 2012, Abd El-Kader et al., 2022), two studies in Kuwait (El-Sabban, 2020, Jennings et al., 2018), and one in Bahrain (Wahab, 2018). Of the ten studies from Saudi Arabia, four were based in Riyadh (TURKISTANI and SAATY, 2020, Alkhathami et al., 2021, Alassaf et al., 2020, Al-Barqi et al., 2020), three in Jeddah (Arfaoui et al., 2021, Alkhaldy et al., 2020, TURKISTANI and SAATY, 2020), and one in Al-Hasa (Binobead et al., 2022), Madinah (Jalloun and Youssef,

2020) and Abha (Riaz et al., 2022). Of the three studies conducted in UAE, one covered the whole of UAE (Basarir and Sherif, 2012), one was based in Ras Al-Khaimah (Abd El-Kader et al., 2022) and one in Al-Ain (Washi, 2012). Of the sixteen studies, three included females only (Riaz et al., 2022, Jalloun and Youssef, 2020, Al-Barqi et al., 2020) . Fifteen studies were cross sectional and one was a case study (Basarir and Sherif, 2012). All were conducted between 2009 (Washi, 2012) and 2020 (Arfaoui et al., 2021, AlShehri and AlMarzooqi, 2022, Alkhathami et al., 2021). The sample size of all sixteen papers was 9937, ranging from 100 (El-Sabban, 2020) to 1443 (Alassaf et al., 2020) and included adults aged 18-50 years. Of the sixteen studies, seven were conducted at a university campus (Riaz et al., 2022, Jalloun and Youssef, 2020, Alkhaldy et al., 2020, Abd El-Kader et al., 2022, Jennings et al., 2018, Al-Barqi et al., 2020), four at restaurants (Binobead et al., 2022, TURKISTANI and SAATY, 2020, Alkhathami et al., 2021, Alassaf et al., 2020), two in grocery stores (El-Sabban, 2020, Washi, 2012), one at a food market (Wahab, 2018), one in a hospital (Arfaoui et al., 2021) and one did not report the study location (Basarir and Sherif, 2012). Most of the studies relied on self-reported measures of food label understanding. Data was collected through validated questionnaires in twelve studies (Arfaoui et al., 2021, AlShehri and AlMarzooqi, 2022, Riaz et al., 2022, Binobead et al., 2022, Jalloun and Youssef, 2020, Alkhaldy et al., 2020, TURKISTANI and SAATY, 2020, Abd El-Kader et al., 2022, Jennings et al., 2018, Alkhathami et al., 2021, Alassaf et al., 2020, Al-Barqi et al., 2020),questionnaire and interview in three studies (El-Sabban, 2020, Washi, 2012, Wahab, 2018) and interview only in one study (Basarir and Sherif, 2012).

The primary focus of all studies was to assess knowledge and usage of food labelling. Of the sixteen studies, twelve measured the association between food labelling and social demographic status. Ten of these examined age (Arfaoui et al., 2021, AlShehri and AlMarzooqi, 2022, Riaz et al., 2022, Alkhaldy et al., 2020, TURKISTANI and SAATY, 2020, El-Sabban, 2020, Basarir and Sherif, 2012, Abd El-Kader et al., 2022, Alassaf et al., 2020, Binobead et al., 2022) and gender (Arfaoui et al., 2021, AlShehri and AlMarzooqi, 2022, Binobead et al., 2022, Alkhaldy et al., 2020, TURKISTANI and SAATY, 2020, El-Sabban, 2020, Washi, 2012, Basarir and Sherif, 2012, Abd El-Kader et al., 2022, Alassaf et al., 2020), eleven considered studying and educational level (Arfaoui et al., 2021, AlShehri and AlMarzooqi, 2022, Riaz et al., 2022, Binobead et al., 2022, Alkhaldy et al., 2020, TURKISTANI and SAATY, 2020, El-Sabban, 2020, Washi, 2012, Basarir and Sherif, 2012, Jennings et al., 2018, Alassaf et al., 2020), five assessed employment (Arfaoui et al., 2021, Binobead et al., 2022, Alkhaldy et al., 2020, TURKISTANI and SAATY, 2020, El-Sabban, 2020), seven examined income (Arfaoui et al., 2021, AlShehri and AlMarzooqi, 2022, Riaz et al., 2022, TURKISTANI and SAATY, 2020, El-Sabban, 2020, Basarir and Sherif, 2012, Alassaf et al., 2020), six looked at marital status (AlShehri and AlMarzooqi, 2022, Riaz et al., 2022, El-Sabban, 2020, Washi, 2012, Abd El-Kader et al., 2022, Alassaf et al., 2020), four explored having children (Arfaoui et al., 2021, Riaz et al., 2022, Washi, 2012, Basarir and Sherif, 2012), and four analysed health status (Arfaoui et al., 2021, Binobead et al., 2022, TURKISTANI and SAATY, 2020, El-Sabban, 2020), with six in BMI (AlShehri and AlMarzooqi, 2022, Binobead et al., 2022, Jalloun and Youssef, 2020, Alkhaldy et al., 2020, TURKISTANI and SAATY, 2020, El-Sabban, 2020), three in diet, (Arfaoui et al., 2021, TURKISTANI and SAATY, 2020, El-Sabban, 2020), and two in physical activity (TURKISTANI and SAATY, 2020, El-Sabban, 2020).

3.2. Which consumers consider food labelling?

Studies included in this review also measured the association between knowledge of food labelling and social demographic characteristics. Significant associations were shown between nutritional knowledge and gender, level of education, health status, and income. Educational level plays a supportive role in understanding and using food labelling. Ten studies reported that consumers with a higher level of educational achievement were most able to understand and use food labelling, majority of these studies conducted on Saudi Arabia (Arfaoui et al., 2021, TURKISTANI and SAATY, 2020, Riaz et al., 2022, Binobead et al., 2022, Alkhaldy et al., 2020, El-Sabban, 2020, Washi, 2012, Abd El-Kader et al., 2022, Alassaf et al., 2020, AlShehri and AlMarzooqi, 2022). Generally, people with lower levels of educational achievement and those with lower incomes (Arfaoui et al., 2021, AlShehri and AlMarzooqi, 2022, Riaz et al., 2022, Alkhaldy et al., 2020, TURKISTANI and SAATY, 2020, El-Sabban, 2020, Alassaf et al., 2020) were less likely to use food labelling and had more difficulty understanding the terms used on food labels. Men were less likely to report an interest in reading food labelling (Arfaoui et al., 2021, AlShehri and AlMarzooqi, 2022, Binobead et al., 2022, Alkhaldy et al., 2020, TURKISTANI and SAATY, 2020, El-Sabban, 2020, Abd El-Kader et al., 2022, Alassaf et al., 2020). Women may be more interested in nutrition for reasons of weight control (Grunert and Wills, 2007). Consumers with health conditions, those overweight or obese, and those generally aware of the overall link between health and food were more likely to have a positive attitude towards food labelling and reported higher

Table 1: Summary of the general characteristics of the included studies

No.	Sample Size	Age	Male	Female	Date of study conducted	Type of studies	Method	Country	Place	Power calculation	Response rate	Results
Arfaoui *et al.* (2021)	722	>18	285	437	2020	Cross sectional	Online survey	Saudi Arabia, Jeddah	Hospital	Yes	Yes	Females had higher knowledge and understanding food label than males, younger participants had higher overall knowledge, healthcare sector employees had higher knowledge scores, grocery shopping family members had more nutrition label knowledge, and students had higher knowledge.
AlShehri *et al.* (2022)	435	>18	218	217	2020	Cross sectional	Online survey	Saudi Arabia, Riyadh	Restaurant	Yes	Yes	83.9% of participants were able to understand calorie labels and were familiar with the menu calorie labelling policy in Saudi Arabia. Overweight and obese participants were more likely to have a positive attitude towards menu care labelling, while gender, educational attainment, marital status, and BMI level were associated with attitudes and practices.
Riaz *et al.* (2022)	350	19-24	0	350	214-2017	Cross sectional	Questionnaire	Saudi Arabia, Abha	University	Yes	Yes	Students were aware of the importance of food labelling and replaced items based on value, cost, and shopping lists.
Binobead *et al.* (2022)	403	>18	104	299	not reported	Cross sectional	Online survey	Saudi Arabia, Alhasa	University	Not reported	Not reported	Participants have moderate knowledge of nutrition, 44.4% read the "calories and energy" contents first, 31.3% read the "vitamins and minerals" contents at the end, and age and BMI have no effect on their nutrition knowledge.
Jalloun *et al.* (2022)	525	18-24	0	525	2019	Cross sectional	Questionnaire`	Saudi Arabia, Madinah	University	Not reported	Yes	Over 60% of participants were not using nutrition labels, especially among college students (colleges of arts and humanities), unmarried, and obese.

Alkhaldy *et al.* (2020)	1228	18-80	489	739	2019	Cross sectional	Online survey	Saudi Arabia, Jeddah	University	Yes	Yes	Participants reported sufficient knowledge to make healthy choices, 55% perceived the policy as useful, 76% chose less energy-dense meals, and 62% experienced changes in food selections.
Turkistani *et al.* (2020)	454	18-50	132	322	2019	Cross sectional	Questionnaire	Saudi Arabia	Restaurant	Not reported	Not reported	Females have higher nutritional knowledge scores, while high education and income contribute to higher scores. Taste is the main factor influencing food choices, with 66.1% being very good. Significant associations exist between gender, education, health status, income, dieting, and exercising.
El-Sabban *et al.* (2020)	100	18-50	34	66	not reported	Cross sectional	Questionnaire - Interview	Kuwait	Grocery shop	Not reported	Not reported	50% of people are familiar with food labels, 74% shop for nutrition claims, and 60% of parents shop for low-fat products. Marital status does not significantly impact awareness, but parents' education level significantly impacts knowledge.
Washi (2012)	1200	not reported	548	652	2009	Cross sectional	Interview - Questionnaire	UAE-AL3en	Grocery shop	Yes	Not reported	A survey of 1200 UAE consumers found 89.5% were aware of food labels, but only read basic information like production and expiry dates. This suggests increased diet-related diseases may be linked to pre-packaged food consumption and inadequate food labelling awareness.
Basarir and Sherif (2012)	500	not reported	0	0	not reported	Case study	Interview	UAE	not reported	Yes	Yes	The study found that 89.6% of UAE respondents read food labels, with expiration date, ingredients list, and country of origin being key attributes.
Abd El-Kader *et al.* (2022)	120	18-25	33	87	2018-2019	Cross sectional	Questionnaire	UAE-Ras Alkimah	University	Yes	Yes	Only 16.7% of nursing students use food labels when purchasing food products, but over half feel it's important. Age, nationality, and weight category are significant factors. Barriers include health problems, lack of knowledge, and time.

												Nutrition awareness campaigns and education programs are crucial for promoting label use among college students and young adults. Future research should assess the role of label use on improved dietary decisions.
Wahab (2018)	430	not reported	173	258	2017	Cross sectional	Questionnaire - validated -interview	Bahrain	Food Market	Not reported	Not reported	A study of 430 Bahraini consumers assessed their knowledge, attitudes, and practices regarding food labels. 65% buy pre-packaged food, but only 42% read the labels. Most consumers read basic information like production and expiry dates, and 60% believe food labels are useful tools. The study aims to educate consumers about the importance of reading food labels and raise awareness about nutrition aspects for informed choices.
Jenning *et al.* (2018)	1100	not reported	300	700	not reported	Cross sectional	Questionnaire	Kuwait	University	Not reported	Yes	Kuwait University students rarely read nutrition labels, with reasons including time shortages and unclear information. The most sought information was expiry date, date of manufacture, country of manufacture, storage instructions, and calorie count. The impact on healthier eating is uncertain, but better label design and education could improve.
Alkhathami *et al.* (2021)	355	18-45	136	249	2020	Cross sectional	Questionnaire – validated -	Saudi Arabia, Riyadh	Restaurant	Not reported	Not reported	A study found that 24.4% of participants used calorie information on menus for meal decisions. Attitude and perceived behavioural control were significant predictors of using caloric information for meal selection. The study found that when frequency of using calorie information increases, the mean scoring value increases gradually in all questions

												except for the item “My friends think I should use calorie information on menus every time I go to a restaurant."
Alassaf *et al.* (2020)	1443	18-> 46	924	431	2019	Cross sectional	Questionnaire - validated -	Saudi Arabia, Riyadh	Restaurant	Not reported	Yes	A study analysed 1265 surveys, finding 88% understood calorie meaning and values, 53% knew daily calorie intake, and 83% supported calorie labelling policy. Around 50% of participants were significantly influenced by calorie labelling, with age, education, and higher monthly income being significant factors. Women aged 26 and above, married, with a bachelor's degree, employed, and higher income were more likely to order less food.
Al-Barqi *et al.* (2020)	572	21	0	572	2019	Cross sectional	Questionnaire - validated -	Saudi Arabia, Riyadh	University	Not reported	Yes	The study found that 27.4% of participants used food labels, with 59.4% having moderate nutrition knowledge. Factors influencing label use included nutrition knowledge, attitude towards health value, and taste. Time constraints, no interest, and difficulty were main barriers.

Table 2: Quality assessments

Studies	**Selection**				**Outcomes**		
Author, year	Sample appropriate	Sample size justified	Response rate and characteristics of non-responders and responders reported	Validated method of measuring knowledge of food labelling	Knowledge presented by social demographic statue, and/or adjusted for gender	Statistical analyses clearly explained confidence intervals or standard error presented	Overall score†
	Max: **	**Max: ***	**Max: ****	**Max: ****	**Max: ****	**Max: ***	**Max: 10**

Arfaoui *et al.* (2021)	**	*	*	**	**	*	9
AlShehri *et al.* (2022)	**	No	*	**	**	*	8
Riaz *et al.* (2022)	**	No	*	No	*	No	2
Binobead *et al.* (2022	No	No	*	No	*	No	2
Jalloun *et al.* (2022)	No	No	*	*	*	*	4
Alkhaldy *et al.* (2020)	**	Not clear	*	**	**	No	7
Turkistani *et al.* (2020)	No	No	*	**	**	No	5
El-Sabban *et al*, (2020)	No	No	*	No	**	No	3
Washi (2012)	**	No	**	**	**	No	8
Basarir and Sherif (2012)	**	No	No	No	No	*	3
Abd El-Kader *et al.* (2022)	*	Not clear	*	*	*	No	4
Wahab (2018)	no	no	*	**	*	No	4
Jenning *et al.* (2018)	No	No	*	**	*	*	5
Alkhathami *et al.* (2021)	No	No	*	*	*	No	3
Alassaf *et al.* (2020)	**	*	*	**	**	*	9
Al-Barqi *et al.* (2020)	No	No	No	*	*	No	2

† Max overall score = 10. Two points allocated for appropriate sample, response rate, validated method, knowledge presented by social demographic status and adjusted for gender. One point allocated for sample size justified and statistical analysis. Overall quality classified as good quality: 10-8 stars, fair quality: 7-4 stars, and poor quality: >4 stars

levels of food label usage (El-Sabban, 2020, AlShehri and AlMarzooqi, 2022, Jalloun and Youssef, 2020, TURKISTANI and SAATY, 2020, Arfaoui et al., 2021, Binobead et al., 2022). Saudi Arabia introduced a mandatory regulation in 2019 stating that calorie content must be published on all restaurant menus (Samara et al., 2019). Three studies were identified which assessed whether consumers could understand and use the calorie labels included on restaurant menus (AlShehri and AlMarzooqi, 2022, Binobead et al., 2022, Alassaf et al., 2020), with two reporting that the majority of participants understood and used the calorie labels which encouraged them to choose meals with fewer calories (AlShehri and AlMarzooqi, 2022, Alassaf et al., 2020). Participants who were overweight or obese, had a bachelor's degree or above, and an income of more than 10,000 Saudi Riyal were more likely to be influenced by calorie labelling to choose healthier options.

3.3. Quality assessment

Study quality is summarised in Table 2. Study quality was scored out of ten and the quality of the studies ranged from two (Riaz et al., 2022, Binobead et al., 2022) to nine (Arfaoui et al., 2021). Seven studies reported power calculations of the sample size (Table 2). Most studies used convenience samples of the general population, with seven studies using representative samples of an area (Arfaoui et al., 2021, AlShehri and AlMarzooqi, 2022, Riaz et al., 2022, Alkhaldy et al., 2020, Washi, 2012, Basarir and Sherif, 2012, Alassaf et al., 2020). Fifteen studies reported response rates but non-reported on the characteristics of non-responders (Table 2). Twelve studies used validated questionnaires to measure knowledge of food labelling (Arfaoui et al., 2021, AlShehri and AlMarzooqi, 2022, Alkhaldy et al., 2020, TURKISTANI and SAATY, 2020, Washi, 2012, Wahab, 2018, Jennings et al., 2018, Alassaf et al., 2020, Al-Barqi et al., 2020, Jalloun and Youssef, 2020, Alkhathami et al., 2021). Of the sixteen included studies, only six studies reported confidence interval or standard error (Arfaoui et al., 2021, AlShehri and AlMarzooqi, 2022, Jalloun and Youssef, 2020, Basarir and Sherif, 2012, Jennings et al., 2018, Alassaf et al., 2020).

4. Discussion

As a population-based approach, nutrition food labels have the potential to influence individual behaviour change and population health. These influences are dependent on consumers' ability to understand and apply the nutritional information on food labels.

In most Arab countries, the importance of food label policies and regulations is well documented in the literature. This review shows that consumers generally have moderate knowledge and use of food labelling information, while the importance of food labelling remains uncertain. Cannoosamy et al. (Cannoosamy et al., 2014) suggested that public health educators should understand regional populations before developing educational strategies as age, education, household income and family size are significant factors in food label knowledge and confidence (Cannoosamy et al., 2014). Research-based evidence suggests that education is positively correlated with consumer knowledge of and attitude towards food labels. This review indicates that consumers with a higher educational level are more likely to make informed choices about food consumption based on the information provided on food labels. A review of 28 studies found a significant correlation between nutrition knowledge and food label use, with 18 studies indicating that consumers with higher levels of nutritional knowledge understood nutrition labels better than those with a lower level of nutritional knowledge (Miller and Cassady, 2015). It was also evident that despite being aware of the importance of reading food labels in adopting healthier dietary habits, consumers were more focused on the manufacturing data, expiration date, and package contents. This indicates that nutrition knowledge plays a significant role in the efficacy and frequency of food label use versus understanding the information on food labels while shopping (Miller and Cassady, 2015). Furthermore, educated consumers access academic sources more regularly, have more exposure to health related news, and are more aware of the correlation between diet and health (Binobead et al., 2022).

The review indicated that older consumers were more careful about their diet and more diligent in reading food labels (Arfaoui et al., 2021, Basarir and Sherif, 2012, Jennings et al., 2018). This may be because older individuals are health-conscious and prioritise a balanced diet as they may have specific dietary restrictions or health conditions which require them to monitor their intake of nutrients or allergens (Binobead et al., 2022, Arroyo et al., 2021).

Wahab (2018) reported similar findings in research conducted among Bahraini consumers which showed that consumers with chronic diseases were more aware of food labelling than consumers not suffering from chronic diseases (Wahab, 2018). This is consistent with previous findings since consumers with chronic conditions are at risk and aim to avoid the negative health effects of certain nutrient content such as sugar, salt, fat and excess calories (Willett et al., 2006). The Ministry of Health of Saudi Arabia has expended significant resources in promoting public health programmes and raising awareness of a healthy diet, chronic disease prevention (diabetes, obesity) and physical activity. This has led to moderate levels of nutrition knowledge and responsible food label usage in the country (Almalki et al., 2011). Nutrition plays a crucial role in achieving a healthier lifestyle. A healthy diet is characterised by the consumption of nutrient-rich foods, such as fruits and vegetables, foods high in fibre and low in sugar and fat. The public health system and food industry have a responsibility to ensure that clear information is provided to consumers on food and support the general population in making healthier food choices.

Eight studies reported that women have more knowledge of food labelling than men (Arfaoui et al., 2021, AlShehri and AlMarzooqi, 2022, Binobead et al., 2022, Alkhaldy et al., 2020, TURKISTANI and SAATY, 2020, El-Sabban, 2020, Abd El-Kader et al., 2022, Alassaf et al., 2020). This is consistent with other studies in which the research found that women were more likely to use and understand nutritional labels than men (Grunert et al., 2010, Christoph et al., 2016). The higher values recorded in females may be due to them being more concerned about fitness and appearance than men, which makes them more selective and inclined towards healthier meals (Prathiraja and Ariyawardana, 2003). Vlassoof (Vlassoff, 2007) reported that many males do not value nutritional information, or consider its role in making healthy food choices: in some respects, they may not consider the importance of health in general (Vlassoff, 2007). These findings highlight the need for targeted educational initiatives to increase nutritional literacy among men. It is crucial to bridge this knowledge gap to ensure that both men and women make informed food choices for their overall health and well-being.

Healthier foods are more expensive compared to unhealthy foods, which may limit the ability of individuals to make better food choices (Jones et al., 2014). As a result, lower-income individuals and families may be more inclined to purchase cheaper, unhealthy options due to financial limitations. This creates a concerning cycle in which those who would benefit the most from nutrient-rich foods are least able to afford them. In this review, seven studies found associations between income and knowledge of food labelling; consumers who had higher incomes were more likely to use and understand food labelling when making purchases (Arfaoui et al., 2021, AlShehri and AlMarzooqi, 2022, Riaz et al., 2022, Alkhaldy et al., 2020, TURKISTANI and SAATY, 2020, El-Sabban, 2020, Alassaf et al., 2020). These results may be explained by lower incomes not only limiting product choice but also limiting use of nutritional information in favour of actively sourcing price information (Drichoutis et al., 2005). It is crucial that policymakers address this disparity and make healthier options more accessible and affordable for all individuals, regardless of the level of income.

Consumers are generally interested in nutritional information on food packaging as they understand the connection between food and health and are motivated to take action towards a healthier lifestyle. Cultural and socioeconomic factors such as price, dietary restrictions, religions and health perceptions significantly influence consumers' dietary decisions, requiring tailored nutritional education and awareness raising interventions such as public health campaigns, social media outreach to improve food label literacy and frequency among Arab consumers, and address diverse needs and preferences. Also, nutritional educational intervention could be successfully improving the understanding and use of food label information for making healthier food choice

In addition, creating food labels with a more attractive design could provide consumers with more consistent, understandable and usable information. Incorporating colour-coded labels or symbols to indicate the nutritional value or potential health risks of a product could help consumers make more informed choices. Additionally, providing clear and concise information about serving size and daily recommended intake values for key nutrients could empower individuals to maintain a well-balanced diet.

5. Conclusion

Research on food label use among Arab consumers is limited, and its impact on healthy food choices remains unclear. The review highlighters that lower knowledge of food labelling among low income and less education level groups. Therefore, further evaluation is needed to understand the casual links among food labelling knowledge, food label used, and dietary intake among different populations of individual in order to plan more effect educational programs. . By implementing research-based guidelines for food labelling, we can contribute to a

healthier society by promoting transparency and supporting individuals in making healthier food choices and tackling public health issues and chronic disease such as obesity and diabetes.

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