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# Consumer Awareness, Knowledge, Understanding, and Use of Nutrition Labels in Africa: A Systematic Narrative Review

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## Abstract

The purpose of nutrition information on a nutrition label is to communicate to consumers the nutritional content of prepackaged foods so that they would be able to identify healthy foods before purchase. Many systematic reviews in the area of consumer awareness, knowledge, understanding, and use of nutrition labels have focused on the United States, Canada, Asia, Europe, Australia, and New Zealand, and little attention has been given to African countries. To review the state of consumer awareness, knowledge, understanding, and use of nutrition labels within the African region, identify barriers to the use of nutrition labels, identify consumers who are more likely to use labels, and assess the factors that affect purchasing decisions. Searches were done in electronic databases (PubMed, Google Scholar, Semantic Scholar, Web of Science) and the reference lists of relevant research articles (back referencing). The review was limited to cross-sectional peer-reviewed research articles which were published in the English Language between January 2000 and June 2022. Twenty-six peer-reviewed papers from 10 African countries that met our inclusion criteria are included in this systematic review. The overall crude means of levels of awareness, knowledge, understanding, and use of nutrition labels were found to be 74.2%, 56.4%, 45.3%, and 69.1%, respectively. Consumer levels of knowledge and understanding of nutrition labels across the 10 African countries were low compared to the awareness and use of nutrition labels.

## Plain Language Summary

The purpose of nutrition information on a nutrition label is to communicate to consumers the nutritional content of prepackaged foods so that they can identify healthy foods before making purchases. In this study, we aimed to review the state of consumer awareness, knowledge, understanding, and use of nutrition labels within the African region. Searches were done in electronic databases (PubMed, Google Scholar, Semantic Scholar, Web of Science) and the reference lists of relevant research articles (back referencing). Twenty-six peer-reviewed papers from 10 African countries that met our inclusion criteria are included in this systematic narrative review. Our finding that consumer levels of knowledge and understanding of nutrition labels were low suggests the need for specific policies and public health interventions that would improve consumer understanding of nutrition information on labels will be more effective in the African region for better health outcomes. We identified gaps in the literature regarding the lack of studies in some African countries on consumer awareness, knowledge, and use of nutrition labels in making purchasing

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decisions of food. The review suggests the need for food industries and government institutions to review how nutrition information are currently presented on nutrition labels for better consumer understanding. However, the findings are subject to the limitations of the individual studies that met eligibility criteria and included in our review.

**Keywords**
nutrition labels, consumer awareness, consumer knowledge, consumer use, consumer understanding

## Introduction

According to the World Health Organization (WHO), globally non-communicable diseases (NCDs) are responsible for about 71% of all deaths every year, and approximately 77% of these deaths from NCDs occur in low-income and middle-income countries (World Health Organization [WHO], 2018b). Many studies have shown that obesity is a major risk factor for several NCDs, and the prevalence rates of obesity are rising speedily in both developed and developing countries (Gona et al., 2021; Keramat et al., 2021; Okati-Aliabad et al., 2022; Paul et al., 2023). However, the factors that predispose people to obesity are sundry and complex, with food intake being the most usual (Cory et al., 2021). Therefore, consumers must be educated about healthy foods and appropriate dietary practices so that they can make informed decisions about their food choices (Mayne & Spungen, 2017).

A healthy diet aids in the protection of populations against malnutrition in all its forms (Bain et al., 2013). The dietary patterns of many populations have changed over the last two decades (Bosu, 2015). Studies have shown that factors such as food globalization, urbanization, and convenience, among others have led to the majority of people consuming more prepackaged processed foods that are usually high in calories (Shamim et al., 2022). A global report by the WHO (2018a) revealed that many populations consume more foods that contain excessive amounts of energy, fats, sugars, and salt. Hence, the need for nutrition information on a nutrition label is to communicate to consumers the nutritional content of prepackaged foods, so that they would be able to identify healthy foods before purchase (Shamim et al., 2022).

Systematic reviews in some European and Arab countries, as well as countries in North America, have indicated that segments of populations are either unaware of nutrition labels or do not understand the nutrition information that is usually provided on nutrition labels (Benajiba et al., 2020; Campos et al., 2011; Talati et al., 2019). Many systematic reviews in the area of consumer awareness, knowledge, understanding, and use of nutrition labels have focused on the United States, Canada, Asia, Europe, Australia, and New Zealand (Benajiba et al., 2020; Grunert & Wills, 2007; Kasapila & Shaarani, 2016; Mhurchu & Gorton, 2007; Persoskie et al., 2017). Little attention has been given to African countries, therefore this systematic review sought to review the state of consumer awareness, knowledge, understanding, and use of nutrition labels within the African region. In addition, the review sought to also identify barriers to the use of nutrition labels, identify consumers who were more likely to use labels, and assess the factors that affect purchasing decisions.

## Theoretical Framework

This systematic review is based on consumer behavior models, which explain the factors associated with consumers' buying decision processes and how they influence consumer behavior (Jisana, 2014). Our proposition was that when consumers are aware, and have much knowledge and understanding of nutrition labels, they are more likely to use nutrition information on labels when making food purchases to informed healthier food choices. In addition, we hypothesized that socioeconomic factors, level of education, cultural influences, and other external factors have the potential to influence the relationships between consumer awareness, knowledge, understanding, and use of nutrition labels (Wills et al., 2012).

## Methods

This is a systematic narrative review of studies that examined nutrition label use in African countries, and it followed the PRISMA guidelines for reporting a systematic review (Yepes-Nunez et al., 2021). The protocol for the study was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (Registration number: INPLASY202270001). The review was limited to cross-sectional peer-reviewed research articles, which were conducted in the English Language, assessing the level of consumer awareness, knowledge, understanding, and the use of nutrition labels, as well as the factors that influence food purchasing choices and the barriers to the use of nutrition labels in African countries. This study was not restricted to consumers of a particular age group, gender, or educational background. However, the review was limited to studies that utilized "normal" healthy populations who were without any diagnosed existing medical conditions.

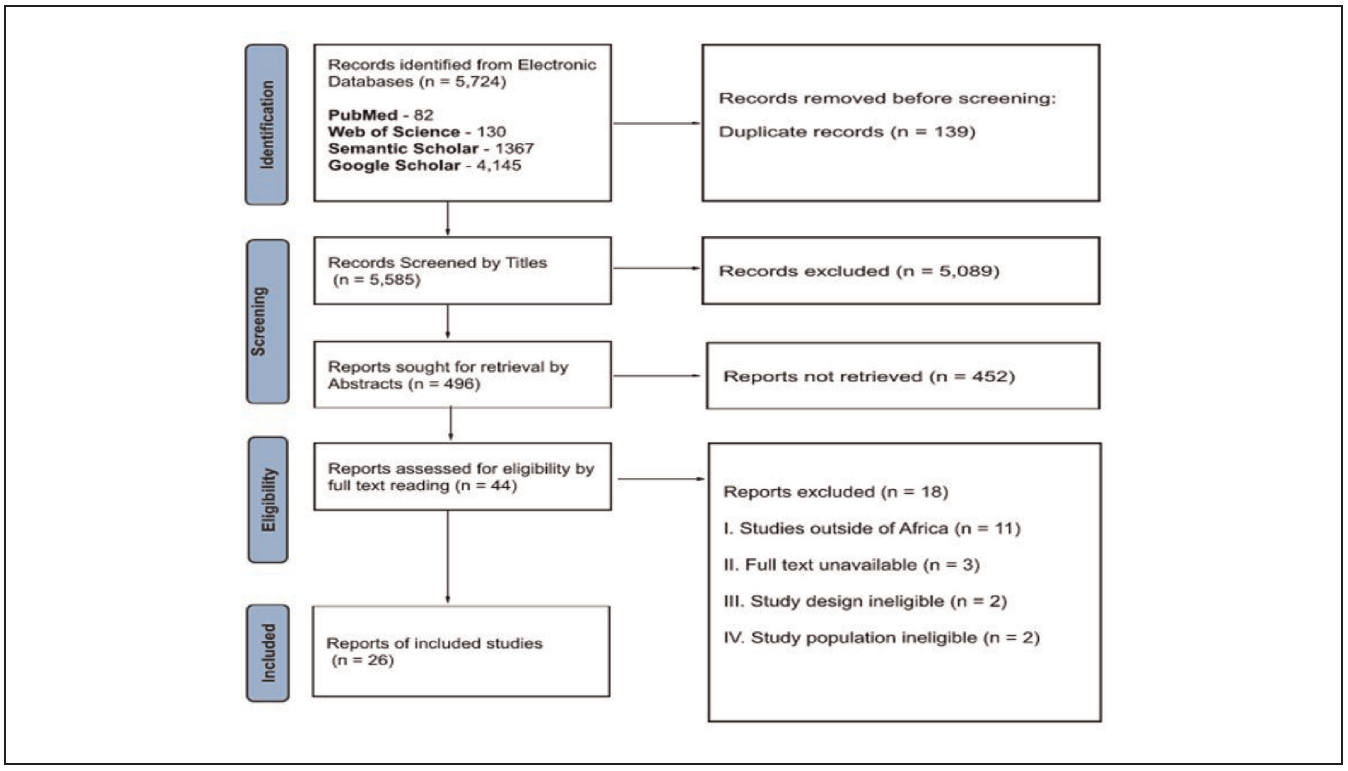


**Figure 1.** PRISMA flow diagram illustrating the study selection process for the systematic review.

## Eligibility Criteria of Papers for Inclusion in the Review

The following inclusion criteria were used in the selection of research articles:

1. Peer-reviewed research articles published in the English Language.
2. Articles published between January 2000 and June 2022.
3. Studies conducted in African countries.
4. Studies that used healthy populations.

## Search Strategy

Searches were done in electronic databases (PubMed, Google Scholar, Semantic Scholar, Web of Science) and the reference lists of relevant research articles (back referencing). The time interval for the articles search was chosen to give the researchers the space to evaluate the trends in consumer awareness, knowledge, understanding, and use of nutrition labels over the period. The search terms used included: "awareness of nutrition labels" OR "awareness of food labels", "use of nutrition labels "OR" use of food labels," "understanding of nutrition labels" OR " understanding of food labels," "knowledge of nutrition labels" OR "knowledge of food labels," "nutrition labels in Africa" OR "food labels in Africa." A successful search result included an article that contained either awareness, knowledge, understanding, or use of nutrition labels and the country where the study was conducted. The research articles were independently reviewed and screened by PKO and CAD for quality regarding relevance to the study objectives, methodology, and main findings, and assessed either consumer awareness, knowledge, understanding, and use of nutrition labels or combinations of these terms. Where discrepancies occurred for inclusion or exclusion, a third investigator (AKA.) was involved to conduct additional evaluation of the study, and such discrepancies were resolved accordingly. Studies that did not address the main research questions were excluded. We also included studies that examined factors that influence purchasing decisions, barriers to the use of nutrition labels, and consumers who were likely to use nutrition labels. Details of the electronic database searching protocol are shown in Figure 1.

## Results

The articles and their main findings are presented in Table 1. Twenty-six peer-reviewed papers from 10 African countries that met our inclusion criteria are included in this systematic review. Table 1 presents the articles in terms of authors, country, sampling and sample size, population characteristics, objectives, main findings, and conclusions.

**Table 1.** Study Objectives, Population Characteristics, Findings, and Conclusions Per Research Article.

| No. | Authors | Country | Sampling and sample size (N) | Population characteristics | Objectives | Main findings | Conclusions |
|---|---|---|---|---|---|---|---|
| 1 | Mahgoub et al. (2007) | Lesotho | Convenience sampling<br>*N* = 260 | Gender<br>Males—32.7%<br>Females—67.3%<br>Age structure<br>Range 21–50 years—76.2%<br>Others—23.8%<br>Education level<br>High school & below—55.8%<br>Post-sec diploma—30.8%<br>Degree—13.4% | Consumer knowledge and use of nutrition labels, and the effect on purchasing decision | Level of nutrition label knowledge—69.2%. Those who use nutrition labels when buying—63.8%.<br>Appearance, brand name, price, nutrition information, and convenience were the reported factors that influence purchasing decisions the most | Consumers in Lesotho showed a level of knowledge and use of nutrition labels comparable to consumers worldwide.<br>Nutrition education is needed to promote behavior change toward knowledge and use of nutrition labels. |
| 2 | Jacobs et al. (2011) | South Africa | Stratified and Judgmental sampling<br>*N* = 174 | Gender<br>Males—48.9%<br>Females—51.1%<br>Age structure<br>Range 18–45 years—74.9%<br>Others—25.1%<br>Education level<br>High school & below—30.0%<br>Post-sec diploma or degree—70.0% | Consumer use and understanding of nutrition labels and the effect on purchasing decision | Those who use nutrition labels when buying—67.5%. Those who understand nutrition labels—66.7%<br>Technical words, time constraints, small font size, and lack of interest were the reported barriers to the use of nutrition labels. | Reasons for not using nutrition labels were related to both internal and external influences.<br>External influences are associated with product attributes like taste and price.<br>Internal influences are associated with situational factors like time constraints, education, and knowledge levels. |
| 3 | Kasapila and Shawa (2011) | Malawi | Random sampling<br>*N* = 206 | Gender<br>Males 57.3% and Females 42.7%<br>Age structure<br>Range 18–30 years—60.7%<br>Others—39.3%<br>Education level<br>High school & below—46.2%<br>Post-sec diploma—25.2%<br>Degree—28.6% | Consumer use and understanding of nutrition labels and the effect on purchasing decision | Those who use nutrition labels when buying—29.1%. Those who understand nutrition labels—26.2%<br>Urban consumers, females, and those with higher education levels were more likely to use nutrition labels | Consumer levels of use and understanding of nutrition labels in Lilongwe (Malawi) are low.<br>Further studies are needed to understand consumer behavior toward nutrition labels. |
| 4 | Ababio et al. (2012) | Ghana | Random sampling<br>*N* = 455 | Gender<br>Males—49.9% and Females—50.1%<br>Age structure<br>Range 20–49 years—85.9%<br>Others—14.1%<br>Education level<br>High school & below—28.6%<br>Post-sec diploma or degree—71.4% | Consumer use of nutrition labels and the effect on purchasing decision | Expiry date, nutritional information, ingredient, appearance, and price were the reported factors that influence purchasing decisions the most | Consumers were influenced by factors like expiry date, nutrition information, appearance, and price when buying food products.<br>However, their consciousness and use of nutrition labels are jeopardized when they cannot use and understand the labels. |
| 5 | Samson (2012) | Tanzania | Random sampling<br>*N* = 208 | Gender<br>Males—51.9% and Females—48.1%<br>Age structure<br>Range 18–39 years—76.4%<br>Others—23.6%<br>Education level<br>High school & below—31.2%<br>Post-sec diploma or degree—68.8% | Consumer awareness and use of nutrition labels, and the effect on purchasing decision | Level of awareness—25.0%<br>Those who use nutrition labels when buying—93.8%<br>Convenience, religious belief, appearance, and health claims were the reported factors that influence purchasing decisions the most | For consumers who reported that they do not use nutrition labels, technical words, small font sizes, and unfamiliar language were the reported barriers to the use of nutrition labels. |

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**Table 1. (continued)**

| No. | Authors | Country | Sampling and sample size (N) | Population characteristics | Objectives | Main findings | Conclusions |
|---|---|---|---|---|---|---|---|
| 6 | G. Aryee (2013) | Ghana | Convenience sampling<br>*N* = 403 | Gender<br>Males—50.4% and Females—49.6%<br>Age structure<br>Mean age 30.4 years<br>Range 24–35—52.3%<br>Others—47.7%<br>Education level<br>High school & below—46.9%<br>Post-sec diploma or degree—53.1% | Consumer awareness and use of nutrition labels and the effect on purchasing decision | Level of awareness—82.0%<br>Those who use labels when buying—75.0%<br>Nutrition content, expiry date, health claim, brand, and country of origin were the reported factors that influence purchasing decisions the most | The expiry date was the most used nutrition label component in making purchasing decisions.<br>Education level plays a significant role in consumer awareness of nutrition labels.<br>Public nutrition education is needed to improve awareness among consumers with low levels of education. |
| 7 | Azila-Gbettor et al. (2013) | Ghana | Quota and Convenience sampling<br>*N* = 1800 | Gender<br>Males—50.0% and Females—50.0%<br>Age structure<br>Range 31 to 59 years—41.7%<br>Others—58.3% | Consumer use of nutrition labels and the effect on purchasing decision | Those who use nutrition labels when buying—33.4%.<br>Product expiry date, nutritional information, and instruction for use were the reported factors that influence purchasing decisions the most | Nutrition label use was generally low among consumers.<br>Nutrition label use among consumers decreased with aging.<br>Females were more likely to use nutrition labels |
| 8 | van der Merwe et al. (2013) | South Africa | Purposive sampling<br>*N* = 229 | Gender<br>Males 34.0% and Females 66.0%<br>Age structure<br>Range 18–44 years—72.0%<br>Others—28.0%<br>Education level<br>High school & below—43.0%<br>Post-sec diploma or degree—57.0% | Consumer awareness, knowledge and use of nutrition labels, and the effect on purchasing decision | Level of awareness—69.0%.<br>Those who use nutrition labels when buying—70.0%. Level of nutrition label knowledge—86.0%.<br>Highly educated, younger, Afrikaans- and English-speaking consumers seemed to be more knowledgeable regarding nutrition label information, and were more likely to use nutrition labels | The differences in the label knowledge and demographic backgrounds indicate a need for consumer nutrition label education programs, to improve the use and knowledge of consumers when making purchasing decisions. |
| 9 | Osei et al. (2013) | Ghana | Convenience sampling<br>*N* = 250 | Gender<br>Males—57.6% and Females—42.4%<br>Age structure<br>Range 15–45 years—90.4%<br>Others—9.6%<br>Education level<br>High school & below—63.6%<br>Post-sec diploma or degree—36.4% | Consumer use and understanding of nutrition labels and the effect on purchasing decision | Those who use labels when buying—79.6%. Those who understand nutrition labels—38.7%<br>Advertisement and prices were the main reported factors that influence purchasing decisions the most | Although a large proportion of consumers use nutrition labels when buying, it is not the main determinant of purchasing decisions.<br>There is a need to educate consumers about the importance of nutrition labels. |
| 10 | Themba and Tanjo (2013) | Botswana | Random sampling<br>*N* = 150 | Gender<br>Males—41.0% and Females—59.0%<br>Age structure<br>Youth $<$ 35 years—57.0%<br>Adult $\geqslant$ 35 years—43.0%<br>Education level<br>High school & below—41.0%<br>Post-sec diploma or degree—59.0% | Consumer awareness and use of nutrition labels, and the effect on purchasing decision | Level of awareness—78.0%<br>Those who use nutrition labels when buying—88.0%<br>Lack of knowledge, mistrust, small font size and time constraints were the reported barriers to the use of nutrition labels | The level of consumer awareness of nutrition labels is relatively high and most consumers use labels when making purchases.<br>Awareness did not differ significantly according to demographic characteristics, but usage did. Older highly educated females were the most likely to use nutrition labels. |

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**Table 1. (continued)**

| No. | Authors | Country | Sampling and sample size (N) | Population characteristics | Objectives | Main findings | Conclusions |
|---|---|---|---|---|---|---|---|
| 11 | Chopera et al. (2014) | Zimbabwe | Convenience sampling<br>*N* = 320 | Gender<br>Males—48.4% and Females—51.6%<br>Age structure<br>Youth < 18 years—8.1%<br>Older adults > 18 years—91.9%<br>Education level<br>High school & below—72.2%<br>Post-sec diploma or degree—27.8% | Consumer use and understanding of nutrition labels, and the effect on purchasing decision | Those who use nutrition labels when buying—77.2%<br>Those who understand nutrition labels (40.9%)<br>Expiry date, instruction for use, price, and storage conditions were the reported factors that influence purchasing decisions the most | Consumers reported above-average usage of nutrition labels with partial understanding.<br>Further studies are needed to identify ways to improve the understanding and use of nutrition labels among consumers effectively. |
| 12 | Darkwa (2014) | Ghana | Purposive sampling<br>*N* = 100 | Gender<br>Males—46.0% and Females—54.0%<br>Age structure<br>Range 15–45 years—94.0%<br>Others—6.0%<br>Education level<br>High school & below—55.0%<br>Post-sec diploma or degree—45.0% | Consumer awareness and use of nutrition labels and the effect on purchasing decision | Level of awareness—80.0%<br>Those who use labels when buying—75.0%<br>Time constraints and ignorance were the reported barriers to the use of nutrition labels.<br>Price, expiry dates, and brand name were the reported factors that influence purchasing decisions the most | Consumer awareness and knowledge of nutrition labels do not always influence food choices.<br>There is a need to educate consumers about the usage and understanding of nutrition labels, and how to apply the information when making food choices |
| 13 | Falola (2014) | Nigeria | Multi-stage sampling<br>*N* = 120 | Gender<br>Males—27.5% and Females—72.5%<br>Mean age—27 years<br>Education level<br>High school—55.0% | Consumer knowledge of nutrition labels and the effect on purchasing decision | Level of nutrition knowledge—46.7%<br>Females, those with high income, and the educated were more likely to use nutrition labels | Consumer use of nutrition labels differed significantly according to some socio-demographic characteristics (age, gender, education).<br>Public nutrition education is required to enlighten consumers on the benefits of using nutrition labels. |
| 14 | Affram and Darkwa (2015) | Ghana | Random sampling<br>*N* = 600 | Gender<br>Males—53.3% and Females—44.6%<br>Age structure<br>Range 15–35 years—82.0%<br>Others—18.0%<br>Education level<br>High school & below—11.1%<br>Post-sec diploma or degree—88.9% | Consumer awareness and use of nutrition labels and the effect on purchasing decision | Level of awareness—90.0%<br>Those who use labels when buying—82.0%<br>Lack of knowledge, time constraints, and small font sizes were the reported barriers to the use of nutrition labels. | The food choices of the majority of consumers who use nutrition labels are not necessarily influenced by the information on the labels.<br>Consumer awareness and use of nutrition labels did not significantly differ according to gender and age. |
| 15 | Oke et al. (2017) | Nigeria | Multi-stage sampling<br>*N* = 149 | Gender<br>Males—12.8% and Females—87.2%<br>Age structure<br>Youth < 30 years—23.5%<br>Older adults ⩾ 30 years—76.5%<br>Education level<br>High school & below—39.6%<br>Post-sec diploma or degree—60.4% | Consumer use of nutrition labels and the effect on purchasing decision | Those who use labels when buying—56.4%<br>Expiry date, nutrition information, brand, and country of origin were the reported factors that influence purchasing decisions the most | Consumer use of nutrition labels was fair.<br>Public nutrition education is required to improve usage and understanding of nutrition labels |

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**Table 1. (continued)**

| No. | Authors | Country | Sampling and sample size (N) | Population characteristics | Objectives | Main findings | Conclusions |
|---|---|---|---|---|---|---|---|
| 16 | Koen et al. (2018) | South Africa | Stratified sampling<br>*N* = 960 | Gender<br>Males—32.3% and Females—67.7%<br>Age structure<br>Range 18–39 years—62.8%<br>Others—37.2%<br>Education level<br>High school & below—75.9%<br>Post-sec diploma or degree—24.1% | Consumer knowledge, use, understanding of nutrition labels, and the effect on purchasing decision | Those who use nutrition labels when buying—63.3%. Level of nutrition label knowledge—44.4%. Those who understand nutrition labels—57.1%<br>Expiry date, health claims, brand, price, and convenience were the reported factors that influence purchasing decisions the most.<br>Unfamiliar language, small font size, and difficulty to understand were the reported barriers to the use of nutrition labels | Consumers who did not regularly use nutrition labels did not consider label information as very important.<br>Nutrition label knowledge of consumers was generally fair.<br>Most consumers with a higher level of education and income have better knowledge and understanding of nutrition labels. |
| 17 | Ncube et al. (2017) | Zimbabwe | Random sampling<br>*N* = 75 | Gender<br>Males—40.0% and Females—60.0%<br>Age structure<br>Range 18 to 69 years—100.0% | Consumer use of nutrition labels and the effect on purchasing decision | Those who use nutrition labels when buying—37.0%<br>Mistrust was the reported barrier to the use of nutrition labels<br>Females were more likely to use nutrition labels | Nutrition label usage among urban consumers was fairly low.<br>Consumers who use nutrition labels do not adequately understand all the information given on nutrition labels |
| 18 | Sarkodie and Boakye-Kessie (2017) | Ghana | Purposive sampling<br>*N* = 80 | Gender<br>Males—55.0% and Females—45.0%<br>Age structure<br>Range 18–39 years—61.0%<br>Others—39.0%<br>Education level<br>High school & below—64.0%<br>Post-sec diploma or degree—36.0% | Consumer awareness of nutrition labels and the effect on purchasing decision | Level of awareness—100.0%<br>Lack of knowledge, unfamiliar language, time constraints, and familiarity were the reported barriers to the use of nutrition labels | Although consumer awareness and use of nutrition labels were high, results cannot be generalized due to the small sample size.<br>A similar study is needed with a larger sample size to generalize the study outcomes. |
| 19 | P. Aryee et al. (2019) | Ghana | Convenience sampling<br>*N* = 384 | Gender<br>Males—59.1% and Females—40.9%<br>Age structure<br>Range 15 to 30 years—81.0%<br>Others—19.0%<br>Education level<br>High school & below—28.1%<br>Post-sec diploma or degree—71.9% | Consumer awareness, use, and understanding of nutrition labels and the effect on purchasing decision | Level of awareness—98.4%. Those who use labels when buying—95.8%. Those who understand nutrition labels—69.7%.<br>Nutrition content, expiry date, health claim, price, and advertisement were the reported factors that influence purchasing decisions the most | Consumer levels of knowledge, understanding, and use of nutrition labels were found to be comparable to the world.<br>Further studies are needed to understand how consumers perceive nutrition information on nutrition labels. |

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**Table 1. (continued)**

| No. | Authors | Country | Sampling and sample size (N) | Population characteristics | Objectives | Main findings | Conclusions |
|---|---|---|---|---|---|---|---|
| 20 | Madilo et al. (2020) | Ghana | Quota and Convenience sampling<br>*N* = 1,478 | Gender<br>Males—49.2% and Females—50.8%<br>Age structure<br>Range—20–40 years—65.9%<br>Others—34.1%<br>Education level<br>Post-sec diploma or degree −100.0% | Consumer use and understanding of nutrition labels and the effect on purchasing decision | Those who use nutrition labels when buying—91.7%. Those who understand nutrition labels—44.2%.<br>Expiry date, date of manufacture, and health warning were the reported factors that influence purchasing decisions the most. | Consumers had insufficient knowledge and understanding of nutrition label information.<br>Consumers reported that some nutrition label information is difficult to understand.<br>There is a need to create awareness and educate consumers about the dangers of not using nutrition label information. |
| 21 | Tadesse (2019) | Ethiopia | Multi-stage sampling<br>*N* = 630 | Gender<br>Males—43.7% and Females—56.3%<br>Age structure<br>Range 25–34 yrs—44.8%<br>others—55.2%<br>Education level<br>High school & below—73.8%<br>Post-sec diploma or degree—26.2% | Consumer awareness and use of nutrition labels and the effect on purchasing decision | Level of awareness—33.0%<br>Those who use nutrition labels when buying—33.0%.<br>Time constraints, food label mistrust, familiarity, and difficulty to understand were the reported barriers to the use of nutrition labels. Expiry date, brand, country of origin, and nutrition information were the reported factors that influence purchasing decisions the most | Both income and gender did not influence the use of nutrition labels<br>Younger consumers were more likely to use nutrition labels than those who were older |
| 22 | Xazela et al. (2019) | South Africa | Convenience sampling<br>*N* = 150 | Gender<br>Males—43.3% and Females—56.7%<br>Age structure<br>Youth—100.0%<br>Education level<br>Post-sec diploma or degree—100.0% | Consumer awareness, knowledge, and use of nutrition labels, and the effect on purchasing decision | Level of awareness—39.0%<br>Those who use nutrition labels when buying—85.3%<br>Level of nutrition label knowledge—39.8% | The study supports the contextual factors that appear to influence behaviors regarding nutrition label<br>Knowledge.<br>Nutrition education programs are needed for a better understanding of the information on nutrition labels |
| 23 | Alshukri et al. (2020) | Libya | Random sampling<br>*N* = 300 | Gender<br>Males—69.3% and Females—30.7%<br>Age structure<br>Range 30–49 years—72.3%<br>Others—27.7%<br>Education level<br>High school & below—2.0%<br>Post-sec diploma or degree—98.0% | Consumer awareness and use of nutrition labels, and the effect on purchasing decision | Level of awareness—96.3%<br>Those who use nutrition labels when buying—76.0%<br>Time constraints, font size, and unfamiliar language were the reported barriers to the use of nutrition labels | Consumers with university degrees had a high level of awareness of nutrition labels.<br>Occupation and education level were significantly associated with the awareness and use of nutrition labels.<br>Consumers were motivated to use nutrition labels when the product price was low. |

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**Table 1. (continued)**

| No. | Authors | Country | Sampling and sample size (N) | Population characteristics | Objectives | Main findings | Conclusions |
|---|---|---|---|---|---|---|---|
| 24 | Asouzu and Iheme (2020) | Nigeria | Multi-stage sampling<br>*N* = 262 | Gender<br>Males—35.5% and Females—64.5%<br>Age structure<br>Range 30–49 years—57.3%<br>Others—42.7%<br>Education level<br>High school & below—81.3%<br>Post-sec diploma or degree—18.7% | Consumer awareness, use, and understanding of nutrition labels, and the effect on purchasing decision | Level of awareness—83.6%<br>Those who use nutrition labels when buying—71.4%. Those who understand nutrition labels—29.4%. Expiry date, price, and storage conditions were the reported factors that influence purchasing decisions the most. Time constraints, small font size, and difficulty to understand were the reported barriers to the use of nutrition labels | Nutrition label knowledge of consumers was below average.<br>Manufacture and expiry dates were the most used information on nutrition labels among consumers<br>There is a need to improve consumer level of awareness and knowledge of nutrition labels because it influences the usage of nutrition labels. |
| 25 | Feyisa et al. (2021) | Ethiopia | Stratified sampling<br>*N* = 398 | Gender<br>Males—51.0% and Females—49.0%<br>Age structure<br>Mean age—36.4 years<br>Education level<br>High school & below—46.5%<br>Post-sec diploma or degree—53.5% | Consumer awareness, knowledge and use of nutrition labels, and the effect on purchasing decision | Level of awareness—89.9%<br>Level of nutrition label knowledge—52.5%<br>Those who use nutrition labels when buying—44.7.0%<br>Those with a high level of education and income were more likely to use nutrition labels | Education level and income were the two major factors strongly associated with the level of nutrition knowledge of consumers<br>Levels of consumer usage and nutrition label knowledge were low. |
| 26 | Adesina et al. (2022) | Nigeria | Multi-stage sampling<br>*N* = 374 | Gender<br>Males 47.1% and Females 52.9%<br>Age structure<br>Range 18–40 years—88.2%<br>Others—11.8%<br>Education level<br>High school & below—49.5%<br>Post-sec diploma or degree—50.5% | Consumer use and understanding of nutrition labels, and the effect on purchasing decision | Those who use nutrition labels when buying—70.6%<br>Those who understand nutrition labels—35.1%<br>Women were more likely than males to use nutrition labels | Consumer usage and understanding of nutritional labels were not uniform.<br>Nutrition labels usage had an impact on most purchasing decisions<br>Consumer use of nutrition label information is an important means of public nutritional education. |

Seven of the articles assessed consumer awareness and use of nutrition labels: Botswana ($n = 1$), Ethiopia ($n = 1$), Ghana ($n = 3$), Libya ($n = 1$), and Tanzania ($n = 1$); six articles assessed consumer use and understanding of nutrition labels: Ghana ($n = 2$), Nigeria ($n = 1$), Malawi ($n = 1$), South Africa ($n = 1$) and Zimbabwe ($n = 1$); four articles assessed consumer use of nutrition labels: Ghana ($n = 2$), Nigeria ($n = 1$), and Zimbabwe ($n = 1$); three articles assessed consumer awareness, knowledge and use of nutrition labels: Ethiopia ($n = 1$) and South Africa ($n = 2$); two articles assessed awareness, use, and understanding: Ghana ($n = 1$) and Nigeria ($n = 1$); one article assessed awareness of nutrition labels: Ghana ($n = 1$); one article assessed knowledge of nutrition labels: Nigeria ($n = 1$); one article assessed knowledge and use of nutrition labels: Lesotho ($n = 1$) and finally, one article assessed knowledge, use, and understanding of nutrition labels: South Africa ($n = 1$). In addition, 10 of the 26 articles reported on factors that influence purchasing decisions; five articles reported on barriers to the use of nutrition labels; another five articles reported on consumers who were likely to use nutrition labels; four articles reported on both barriers to the use of nutrition labels and factors that influence purchasing decisions; one article reported on both the barriers to the use of nutrition labels and consumers who were likely to use nutrition labels. Different sampling methods were employed by the authors to select participants which are summarized in Table 1.

### Literature Review

*Consumer Awareness, Knowledge, Understanding, and Use of Nutrition Labels.* Our search identified 13 articles that reported on the levels of consumer awareness of nutrition labels in seven different countries. The awareness levels reported ranged between 25% in Tanzania (Samson, 2012) and 100% in Ghana (Sarkodie & Boakye-Kessie, 2017), with the crude average level of awareness being 74.2%. We identified six articles that reported on the levels of consumer knowledge of nutrition labels. Studies that reported the lowest and highest levels of consumer knowledge of nutrition labels were all from South Africa, ranging from 39.8% (Xazela et al., 2019) to 86.0% (van der Merwe et al., 2013). The crude mean level of knowledge was found to be 56.4%. Nine studies reported on the levels of understanding of nutrition labels. The levels of understanding ranged from 26.2% (Kasapila & Shawa, 2011) in Malawi to 69.7% (P. Aryee et al., 2019) in Ghana. The crude mean level of understanding was 45.3%. Finally, 21 studies reported on the levels of consumer use of nutrition labels. The range of levels of understanding was between 29.2% (Kasapila & Shawa, 2011) in Malawi and 95.8% (P. Aryee et al., 2019) in Ghana. The crude mean level of consumer use of nutrition labels was found to be 69.1%.

*Barriers to Consumer Use of Nutrition Labels.* Overall, most of the articles consistently reported that time constraints, small font size, and unfamiliar language were the main barriers to consumer use of nutrition labels. Some other articles reported that difficulty in understanding was a substantial barrier to consumer use of nutrition labels. In Zimbabwe, one article reported that mistrust of nutrition labels (44.0%) was the principal barrier to the use of nutrition labels (Ncube et al., 2017). All the research articles from Lesotho and Malawi did not report on barriers to consumer use of nutrition labels (Kasapila & Shawa, 2011; Mahgoub et al., 2007).

*Factors That Influence Purchasing Decisions.* The leading factors which were reported to influence purchasing decisions were expiry date, brand, and price. In Tanzania, religious belief (2.4%) was also reported as one of the factors that influence purchasing decisions (Samson, 2012). Nonetheless, articles from Malawi, Libya, and Botswana did not report on factors that influence purchasing decisions when buying prepackaged foods (Alshukri et al., 2020; Kasapila & Shawa, 2011; Themba & Tanjo, 2013).

*Consumers Likely to Use Nutrition Labels.* Articles from five countries reported on consumers who were likely to use nutrition labels when buying prepackaged foods. In South Africa, those who speak English, the educated, and the young were the categories of consumers identified as likely to use nutrition labels (van der Merwe et al., 2013). Furthermore, a study in Zimbabwe identified only females as consumers likely to use nutrition labels (Ncube et al., 2017). Finally, in Nigeria, Malawi, and Ethiopia, the educated, female, and high-income earners were the categories of consumers reported as likely to use nutrition labels (Falola, 2014; Feyisa et al., 2021; Kasapila & Shawa, 2011).

## Discussion

This systematic review assessed the scientific evidence from studies on awareness, knowledge, understanding, and use of nutrition labels in African countries. Twenty-six studies met the eligibility criteria for inclusion in this systematic review. Some studies reported on the factors that influence consumer purchasing decisions, the barriers to the use of nutrition labels, and consumers who were likely to use nutrition labels when buying prepackaged foods. All studies were conducted using both males and females, and the education levels of study participants varied from below high school to postsecondary tertiary education. The age structures of participants were diverse in different countries, ranging from 15 to 69 years, and different sampling methods such as random

sampling, purposive sampling, stratified sampling, convenience sampling, and other multistage sampling techniques were used by the authors in their studies.

The overall crude means of levels of awareness, knowledge, understanding, and use of nutrition labels were found to be 74.2%, 56.4%, 45.3%, and 69.1%, respectively. These results show that the extent of consumer awareness and use of nutrition labels were relatively higher compared to the levels of knowledge and understanding of nutrition labels across the African countries where the studies were conducted. This observation is similar to findings from a study conducted in India where the levels of awareness and use of nutrition labels were found to be 74.0% and 80.8%, but only 7.2% of the study participants could understand the information on nutrition labels (Kamboj et al., 2022). More so, other studies in Thailand and across Europe found similar observations where consumer awareness and use of nutrition labels when buying prepackaged foods were high but the nutrition knowledge and understanding of nutrition labels were comparatively low (Grunert et al., 2012; Rimpeekool et al., 2015). A global review has documented that generally, consumers find nutrition labels to be a useful source of nutrition information (Campos et al., 2011). Therefore, as noted in the systematic review by Dumoitier et al. (2019), there is a need to improve nutrition knowledge and understanding of nutrition labels in the African countries where the studies were conducted, through effective nutrition education and other public health strategies.

The factors consistently reported in almost all countries as the main barriers to consumer use of nutrition labels comprised time constraints, small font size, difficulty in understanding, and unfamiliar language. These factors are in line with the findings of other studies where these same factors were reported as the barriers to consumer use of nutrition labels (Besler et al., 2012; Donga & Patel, 2018; Perumal et al., 2022; Rimpeekool et al., 2015; Shamim et al., 2022). However, in Zimbabwe, mistrust was the principal barrier reported by the study participants.

Moreover, price, brand name, expiry date, and convenience were consistently reported as the leading factors that influence purchasing decisions. Similar observations were reported in studies in India and New Zealand where price, expiry date, brand name, and convenience were also the main factors that influence consumer buying decisions (Kamboj et al., 2022; Ni Mhurchu et al., 2018). Nonetheless, in Ghana, Nigeria, and Ethiopia, the country of origin of a prepackaged food product was found to be another essential factor that influenced consumer purchasing decisions. Lastly, in the UK, a systematic review by Ogundijo et al. (2022) identified price as one of the main factors that influence consumer purchasing decisions.

In South Africa, Ethiopia, Nigeria, and Malawi, those who are educated were reported as consumers likely to use nutrition labels. Also, females were reported as likely to use nutrition labels in Zimbabwe, Nigeria, and Malawi. Furthermore, high-income earners were found to be the consumers likely to use nutrition labels in Nigeria and Ethiopia. In other studies, similar findings were reported by Azman and Sahak (2014), and Perumal et al. (2022), where the former found the educated to be the consumers who were likely to use nutrition labels, and the latter also identified those with high incomes, as consumers likely to use nutrition labels. In addition, across the US, UK, New Zealand, Australia, India, Pakistan, and Sri Lanka, other similar studies have reported females as consumers who are more likely to use nutrition labels, and this is in agreement with our findings from this review (Azman & Sahak, 2014; Donga & Patel, 2018; Shamim et al., 2022).

In South Africa, those who were younger were reported as likely to use nutrition labels than older consumers (van der Merwe et al., 2013). This observation is inconsistent with many other studies where both young and older consumers have been reported as likely to use nutrition labels, indicating that it is highly likely that age has no independent relationship with nutrition label use (Natour et al., 2021). For instance, in the research by Azman and Sahak (2014), study participants aged 55 years and beyond were found to be the consumers who were likely users of nutrition labels compared to consumers with ages between 22 and 54 years old. Contrarily, in the research by Liu et al. (2015), younger consumers were reported as those who were likely to use nutrition labels. This review contributes to existing literature by providing an overview of the state of consumer awareness, nutrition knowledge, understanding, and use of nutrition labels in the African region. We identified gaps in the literature regarding the lack of studies in some African countries on consumer awareness, knowledge, and use of nutrition labels in making purchasing decisions of food. The finding that consumer levels of knowledge and understanding of nutrition labels were low suggests the need for specific policies and public health interventions that would improve consumer understanding of nutrition information on labels will be more effective in the African region for better health outcomes. The review suggests the need for food industries and government institutions to review how nutrition information are currently presented on nutrition labels for better consumer understanding. Overall, our review provides valuable information that could inform evidence-based decision making in nutrition education, food safety and food policy for consumer protection.

## Strengths and Limitations

Our review approach followed the PRISMA guidelines for conducting a systematic review and specific eligibility criteria. The strength of this approach includes providing a comprehensive and unbiased synthesis of existing evidence on consumer awareness, knowledge, understanding, and use of nutrition labels in the African region. We followed strict eligibility criteria and specific steps in selecting the included studies in this review. Synthesizing all available evidence from different studies and countries that focused and addressed similar research question to a single place provides a better picture of the state of the situation. However, we acknowledge that our findings may not be directly applicable to all populations because our study approach could not identify similar studies in some African countries. Finally, the findings of this systematic review are subject to the limitations of the individual studies that met eligibility criteria and included in our review. Since studies from only 10 African countries were included in this review, we cannot generalize our findings to the whole of Africa.

## Conclusions

Consumer levels of knowledge and understanding of nutrition labels across the 10 African countries were low compared to the awareness and use of nutrition labels. The main barriers to consumer use of nutrition labels that were reported across the African regions were time constraints, small font size, difficulty in understanding, and unfamiliar language. Price, brand name, expiry date, and convenience were consistently reported in many African countries as the leading factors that influence purchasing decisions of consumers. The educated, female, and high-income earners were identified as the categories of consumers who are likely to use nutrition labels.

## Recommendations

Nutrition education is needed to improve consumer knowledge and understanding of nutrition labels. Interventions to make the information on nutrition labels more simplistic and comprehensive are needed to help consumer understanding. Studies on awareness, knowledge, understanding, and use of nutrition labels in other African countries that were not part of this study are highly recommended. Further studies must investigate the reasons why some consumers do not use nutrition labels when making food purchases.

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### Author Contributions

The research articles were independently reviewed and screened by PKO and CAD. PKO and CAD were also involved in the literature search, and data extraction, and AKA supervised the overall process of the systematic review. PKO, CAD, and AKA participated in the manuscript writing.

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### Availability of Data

Data described in the manuscript will be made available upon request pending approval of the manuscript.

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