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RESEARCH ARTICLE



## Current use of nutrition facts tables and attitudes towards new red and green front-of-package labels among Israeli consumers

Michal Bromberg<sup>a,b</sup>, Tali Sinai<sup>a,c</sup>, Lital Keinan-Boker<sup>a,d</sup>, Ronit Endevelt<sup>d,e</sup> and Dvora Frankenthal<sup>a</sup>

<sup>a</sup>Israel Center for Disease Control, Ministry of Health, Ramat Gan, Israel; <sup>b</sup>School of Public Health, Tel Aviv University, Tel Aviv, Israel; <sup>c</sup>School of Nutritional Sciences, The Robert H. Smith Faculty of Agriculture, Food and Environment, The Hebrew University of Jerusalem, Rehovot, Israel; <sup>d</sup>School of Public Health, University of Haifa, Haifa, Israel; <sup>e</sup>Nutrition Division, Public Health Services, Ministry of Health, Jerusalem, Israel

### ABSTRACT

Front-of-package labels (FOPL) are designed to simplify nutrition information and to help consumers make healthier food choices. The Israeli government has implemented new regulations requiring mandatory red warning FOPL for high levels of sodium, sugar, or saturated fats. A voluntary green positive FOPL for products fitting the national nutritional recommendations was concurrently encouraged. In order to characterise adult consumers' current use of Nutrition Facts Tables (NFT) and their attitudes towards the new FOPL, a nationally representative cross-sectional telephone survey was conducted. Most of the 1,042 survey respondents reported frequent NFT use (76.2%) and intentions to purchase fewer red-labelled (81.1%) and more green-labelled products (85.0%). Consumers with higher BMI and lower education expressed higher intentions to use the new FOPL, but not higher current use of NFT. This finding suggests that these high-risk groups, which the new labels are meant to target, may indeed benefit from the new policy.

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### KEYWORDS

Front of package; nutrition facts table; food labelling; nutrition information; nutrition labels; Israel

### Introduction

Front-of-package labels (FOPL) are designed to simplify nutrition information and to help consumers make healthier food purchases (van der Bend and Lissner 2019). The World Health Organisation recommends using easy-to-understand FOPL as means to address overweight and obesity and preventable diet-related non-communicable diseases, such as cardiovascular disease and diabetes (World Health Organisation 2014). Israel is facing an obesity epidemic. The latest Israeli National Health and Nutrition Survey, conducted on a representative sample of adult citizens between the years 2014 and 2016 (ICDC 2019), estimates that approximately half of the Israeli population is either overweight or obese. This survey (ICDC 2019) also reports high rates of daily consumption of total sugar, saturated fatty acids, and sodium.

As of January 2020, the Israeli government has implemented new regulations (Knesset 2017) requiring manufacturers of food products containing sodium, sugar, and/or saturated fatty acids above pre-defined thresholds to display mandatory warning red labels on the front of the package, indicating which nutrients

are above the recommended amount. Concurrently, foods in accordance with an independent Scientific Committee's recommendations, including packed and unpacked foods in their natural form or with added spices or herbs, or minimally processed foods with no additives, can voluntarily be marked with a positive green label (Gillon-Keren et al. 2020). The thresholds of the new Israeli warning red labels are an adaptation of the current Chilean nutrition labelling regulations, which are among the strictest labelling regulations globally (Reyes et al. 2019); however, unlike Chile, the Israeli FOPL do not mark high caloric content. The main purposes of the new FOPL were to make pre-packaged food information clear and accessible to the public and to enable consumers to make knowledgeable choices of food consumption to improve their well-being (Knesset 2017; Gillon-Keren et al. 2020).

To date, little is known about the Israeli population's attitudes towards red and green FOPL and the potential ability of the new labels to encourage healthier food choices in comparison to the Nutrition Facts Tables (NFT), especially among high-risk populations. An assessment of the population perception and interpretation of these FOPL can help policymakers design

successful strategies that could effectively increase awareness and usage of these labels (Ares et al. 2018) and ultimately encourage healthier food consumption. Furthermore, characterising the new FOPL potential users in comparison to NFT users can assist in tailoring special campaigns to encourage FOPL use in the population, especially among those in higher need of dietary change. The main objectives of this study were to assess Israeli consumers' current use of NFT on food packages and to evaluate their understanding and attitudes towards the new FOPL. The secondary objective was to examine the associations between consumers' current behaviour and future purchasing intentions and their demographics and health-related characteristics.

## Materials and methods

### Survey design and population

A national cross-sectional telephone interview survey of Israeli households was conducted between January and March 2020 by the Israel Center for Disease Control in the Ministry of Health. A random sample of landline and mobile telephone numbers of Jewish and Arab households was extracted. Households were excluded if they fulfilled at least one of the following criteria: no contact after eight attempts, none of the household residents was 21 years or older, none spoke Hebrew or Arabic or was able to complete the questionnaire due to mental or physical disability, or the telephone line was commercial or disconnected. Nonresponses included outright refusals to participate, repeated postponements, and partially completed interviews.

### Questionnaire and data collection

Data were collected by a structured questionnaire administered by telephone, using a computer-assisted telephone interview (CATI) system. The interview was conducted in either Hebrew or Arabic by trained interviewers. The Hebrew questionnaire was translated into Arabic and back-translated into Hebrew for quality control. Both questionnaires were pretested on a pilot sample to ensure that the respondents comprehended all the questions as intended.

### Current NFT use and understanding and attitudes towards the new FOPL

The participants were asked about their level of agreement (“highly agree”, “agree”, “do not agree” and “do

not agree at all”) with multiple statements regarding their current use of NFT and their understanding of and attitudes towards the new FOPL. For this study, the answers were grouped into two categories: “agree” (“highly agree”, “agree”) and “disagree” (“do not agree”, “do not agree at all”).

Current NFT use was assessed by the statement: “I usually check the nutrition table and decide accordingly whether to purchase the food”. Understanding the new FOPL concept was assessed by two statements: “The red label will enable me to know easily and quickly if the food products contain amounts of sugar, fat, and sodium that are above-recommended levels by the Ministry of Health”; and “The red/green FOPL will allow me to make healthier decisions regarding the food I purchase”. Attitudes were assessed by three statements. Two of them were focussed on future purchasing intentions: “I will purchase fewer red-labeled products” and “I will purchase more green-labeled products”. The third statement was “I think that red/green FOPL will promote the population health”. Respondents were also asked to grade price, taste, and contribution to health on a scale from one (most important) to three (least important) according to the influence on their food purchases.

### Demographic variables

Sociodemographic variables included age, gender, population group (Jews/Arabs), education ( $\leq 12$  years/ $> 12$  years), marital status (married/living with a partner, separated/widowed, single), and having children  $< 19$  years (yes/no).

### Health-related variables

Prevalence of selected non-communicable diseases was assessed by the question, “Has a doctor ever diagnosed you with any of the following: hypertension, hyperlipidemia/hypercholesterolemia, coronary heart disease (heart attack/heart failure/angina pectoris) or diabetes?” (yes/no for each). Respondents were also inquired whether anyone from their household has been diagnosed with a health condition that requires food restrictions (e.g. diabetes, coeliac disease, food allergy) (yes/no).

Body mass index (BMI) was calculated as the reported weight (kg) with light clothes and no shoes divided by the square of the reported height (m) without shoes, and categorised into 4 groups: underweight ( $< 18.5$  kg/m<sup>2</sup>), normal weight (18.5 to 24.9 kg/m<sup>2</sup>),

**Table 1.** Demographics and health-related characteristics of the study participants.

Variable	n (%)*
Age	
21–34	195 (31.4)
35–44	250 (20.1)
45–54	214 (16.3)
55–64	209 (15.7)
65+	146 (16.5)
Gender	
Female	511 (51.2)
Male	503 (48.8)
Population group	
Jew	567 (81.6)
Arab	447 (18.4)
Years of education	
≤12	362 (30.8)
>12	635 (69.2)
Marital status	
Married/living with a partner	768 (71.5)
Separated/widowed	111 (10.0)
Single	128 (18.5)
Children <19 years	
Yes	495 (46.6)
No	484 (53.4)
Food restriction of household-member	
Yes	298 (25.1)
No	710 (74.9)
Body mass index (kg/m <sup>2</sup> )	
Underweight (<18.5)	8 (1.0)
Normal weight (18.5–24.9)	413 (50.0)
Overweight (25.0–29.9)	349 (34.4)
Obesity (≥30)	180 (14.6)
Coronary heart disease	
Diagnosed	44 (4.2)
Not diagnosed	963 (95.8)
Diabetes	
Diagnosed	135 (9.8)
Not diagnosed	874 (90.2)
Hypertension	
Diagnosed	222 (19.1)
Not diagnosed	786 (80.9)
Hyperlipidemia/hypercholesterolemia	
Diagnosed	265 (22.4)
Not diagnosed	745 (77.6)
Physical activity	
Yes	561 (56.8)
No	453 (43.2)
Smoking	
Yes	243 (20.3)
No	771 (79.7)

\*Percentages are weighted for the total Israeli population by age, gender, population group, and landline phone ownership, respectively.

overweight (25.0–29.9 kg/m<sup>2</sup>), or obese (≥30 kg/m<sup>2</sup>). Physical activity was assessed by questioning, “Do you regularly engage in physical activity in your free time?” (yes/no). Smoking was assessed by questioning, “Do you currently smoke cigarettes?” (yes/no, including past smoking).

### Statistical analysis

Data were analysed using SPSS version 25 (SPSS Inc, Chicago, IL, USA). For the descriptive analysis, percentages were calculated for all variables. The percentages were weighted by age, gender, population group, and landline phone ownership in order to represent

the total Israeli population ≥21 years of age. Univariate analysis,  $\chi^2$  for categorical variables and *t*-test for continuous variables, was applied to determine the associations between consumers' behaviour and intentions (agree/disagree to the statements) and participants' demographics and health-related characteristics (age and BMI as continuous variables; all other above-mentioned variables as categorical). In addition to age, gender, and BMI, all variables that were statistically significant at  $\alpha < 0.1$  in the univariate analysis were entered into a multivariate analysis using a backward stepwise logistic regression model. A *p*-value of <0.05 was considered statistically significant.

### Ethics statement

According to the Israeli legislation, health telephone surveys are conducted within the regulatory capacity of the Israel Center for Disease Control (Ministry of Health) and do not require the approval of an ethics committee. Oral informed consent was obtained from each participant following a brief explanation about the survey, including its objectives and importance. All data were collected anonymously.

### Results

A random sample of 3,180 households was extracted. After applying the exclusion criteria, 2,050 households remained. Overall, 1,042 participants completed the survey, with a response rate of 50.8%. After excluding 28 inconsistent interviews, the sample for this study included 1,014 participants.

Characteristics of the survey participants are shown in Table 1. The mean age ( $\pm$ standard deviation) of the participants was  $46.3 \pm 16.2$  years and about half were women. Approximately half were overweight or obese and one-third reported at least one obesity-related chronic disease. The majority of the participants were married or living with a partner, almost half had at least one child <19 years and a quarter stated that at least one person in their household required dietary restrictions due to a medical condition.

### Current NFT use

Most participants reported that they usually decide whether or not to purchase a certain food item by checking the NFT on the package (76.2%) and that “contribution to health” is the most important factor that influences their food purchases (56.7%) (Table 2).

**Table 2.** Current use of nutrition facts tables and understanding and attitudes towards the new red and green front-of-package nutrition labels.

Statement	<i>n</i> (%) <sup>*</sup>
Current NFT use	
“I usually check the nutrition table and decide accordingly whether to purchase the food”	
Agree	783 (76.2)
Disagree	224 (23.8)
Understanding the new FOPL	
“The red label will enable me to know easily and quickly if the food products contain amounts of sugar, fat, and sodium that are above-recommended levels by the Ministry of Health”	
Agree	939 (92.6)
Disagree	67 (7.4)
“The red/green FOPL will allow me to make healthier decisions regarding the food I purchase”	
Agree	878 (87.4)
Disagree	119 (12.6)
Attitudes towards the new FOPL	
“I will purchase fewer red-labeled products”	
Agree	840 (81.7)
Disagree	163 (18.3)
“I will purchase more green-labeled products”	
Agree	877 (85.0)
Disagree	126 (15.0)
“I think that red/green FOPL will promote the population health”	
Agree	896 (88.4)
Disagree	107 (11.6)
The most important factor that influences food purchasing:	
Contribution to health	650 (56.7)
Taste	291 (33.6)
Price	74 (9.7)

Abbreviations: NFT: nutrition facts tables; FOPL: front-of-package labels.

<sup>\*</sup>Percentages are weighted for the total Israeli population by age, gender, population group, and landline phone ownership.

**Table 3.** Associations between study participants' current use of nutrition facts tables<sup>a</sup> and their demographics and health-related characteristics<sup>b</sup> – results of multivariate analysis.

Variable	Adjusted OR	CI 95%	<i>p</i> -value
Gender			
Male	1.00	Ref.	
Female	1.83	1.32, 2.53	<0.001
Population group			
Jew	1.00	Ref.	
Arab	1.92	1.38, 2.69	<0.001
Coronary heart disease			
Not diagnosed	1.00	Ref.	
Diagnosed	3.64	1.27, 10.43	0.016
Physical activity			
No	1.00	Ref.	
Yes	2.49	1.80, 3.44	<0.001

Abbreviations: OR: odds ratio; CI: confidence interval; Ref.: reference category.

<sup>a</sup>“I usually check the nutrition table and decide accordingly whether to purchase the food.”

<sup>b</sup>Other variables that were removed by the backward stepwise logistic regression model, with their univariate *p*-value in parenthesis, include: age (*p* = 0.053) and body mass index (*p* = 0.936).

According to the multivariate logistic regression analysis (Table 3), agreement to the statement “I usually check the nutrition table and decide accordingly whether to purchase the food” was significantly associated with female gender, Arab ethnicity, coronary heart disease (CHD) diagnosis, and exercising regularly.

### Understanding the new FOPL

Most participants understood the new red and green FOPL goals to simplify nutritional information to the public regarding food products that contain sugar, fat, and sodium at amounts that are above-recommended levels (92.6%) and to help consumers make healthier food purchases (87.4%) (Table 2).

### Attitudes towards the new FOPL

Most participants (88.4%) think that the red/green FOPL will promote population health (Table 2). Moreover, the majority of them stated that they would purchase fewer red-labelled products (81.7%) and more green-labelled products (85.0%). According to the multivariate logistic regression analysis, the potential influence of the red FOPL on purchasing fewer red-labelled products was associated with female gender, Arab ethnicity, higher BMI, and no smoking (Table 4). The potential influence of the green FOPL on purchasing more green-labelled products was associated with Arab ethnicity, lower education, and higher BMI (Table 5).



**Table 4.** Associations between study participants' attitudes towards the new red front-of-package nutrition labels<sup>a</sup> and their demographics and health-related characteristics<sup>b</sup> – results of multivariate analysis.

Variable	Adjusted OR	CI 95%	<i>p</i> -value
Gender			
Male	1.00	Ref.	
Female	1.47	1.02, 2.12	0.037
Population group			
Jew	1.00	Ref.	
Arab	2.38	1.61, 3.52	<0.001
BMI (kg/m <sup>2</sup> )	1.05	1.01, 1.10	0.027
Smoking			
Yes	1.00	Ref.	
No	1.51	1.02, 2.24	0.041

Abbreviations: OR: odds ratio; CI: confidence interval; Ref.: reference category; BMI: body mass index.

<sup>a</sup>"I will purchase fewer red-labelled products."

<sup>b</sup>Other variables that were removed by the backward stepwise logistic regression model, with their univariate *p*-value in parenthesis, include age (*p* = 0.123) and diabetes (*p* = 0.058).

All variables in the table are statistically significant (*p* < 0.05).

**Table 5.** Associations between study participants' attitudes towards the new green front-of-package nutrition labels<sup>a</sup> and their demographics and health-related characteristics<sup>b</sup> – results of multivariate analysis.

Variable	Adjusted OR	CI 95%	<i>p</i> -value
Population group			
Jew	1.00	Ref.	
Arab	2.89	1.81-4.62	<0.001
Years of education			
>12	1.00	Ref.	
≤12	1.71	1.08-2.69	0.022
BMI (kg/m <sup>2</sup> )	1.05	1.001-1.10	0.045

Abbreviations: OR: odds ratio; CI: confidence interval; Ref.: reference category; BMI: body mass index.

<sup>a</sup>"I will purchase more green-labelled products."

<sup>b</sup>Other variables that were removed by the backward stepwise logistic regression model, with their univariate *p*-value in parenthesis, include age (*p* = 0.802), gender (*p* = 0.776) and food restriction of household-member (*p* = 0.016).

All variables in the table are statistically significant (*p* < 0.05).

## Discussion

This study evaluated the current use of NFT and the understanding and the attitudes towards red and green FOPL, immediately after the implementation of the new FOPL regulations in Israel. According to this nationally representative survey, the majority of the population usually uses NFT, understands the new FOPL and its purposes, and agrees that it will promote public health. Moreover, above 80% of the survey's participants intend to change their food buying habits according to the new labels, by purchasing fewer red-labelled and more green-labelled products. This high approval of the new red and green FOPL is in accordance with other studies (Sikorski et al. 2012; Bos et al. 2013; Mazzocchi et al. 2015; Ares et al. 2018), which demonstrated that nutrition-labelling

policies usually receive high public support. Yet, this study also highlights new potential sub-groups, i.e. consumers with higher BMI and lower education, who expressed higher intentions to use the new FOPL, but not higher current use of NFT. This finding is of utmost importance as it suggests that these high-risk groups, which the new FOPL were meant to target among others, may indeed benefit from the new policy.

The majority of the study's participants (76.2%) reported that they usually decide whether to purchase food after checking the NFT on the package. Other studies that were based on self-reported behaviour (Satia et al. 2005; Chen et al. 2012; Gesser-Edelsburg et al. 2015; Rimpeekool et al. 2017) also demonstrated high usage of nutrition labels. For example, according to a pan-European telephone survey (Gregori et al. 2014), 71.8% of the interviewees reported regularly reading nutrition information. Nieto et al. (Nieto et al. 2019) demonstrated that 70% of White Americans self-reported using the NFT "often". As opposed to self-reported behaviour, studies that used more objective tools, such as verbal protocol analysis (Cowburn and Stockley 2005) and in-store observations and interviews of participants' behaviour (Grunert et al. 2010), showed significantly less use of food labels by consumers. Thus, a bias associated with over-reporting on high usage of NFT due to social desirability cannot be ruled out (Grunert et al. 2010; Kleef and Dagevos 2015). Nevertheless, this study's finding that "contribution to health" is the most important factor that influences the participants' food purchases supports their statement of high usage of NFT. Studies (Cowburn and Stockley 2005; Drichoutis et al. 2006; Grunert et al. 2010; Campos et al. 2011) had shown a positive effect of interest in healthy eating on nutrition labels use.

As the majority of this study's participants usually uses NFT, agrees that the new FOPL will allow them to make healthier food purchases and emphasises the importance of health in their food choices, high intentions to purchase food according to the new FOPL, as were reported in the current study, are to be expected. Other studies (Lando and Labiner-Wolfe 2007; Kleef and Dagevos 2015) had highlighted healthfulness as one of the key criteria for food purchasing and FOPL as a perceived aiding tool for simplifying healthy food choices. Common expressions of future intentions to take into consideration nutritional warning labels when purchasing food were also documented previously in the literature (Ares et al. 2018).

This research demonstrates significantly higher use of nutrition labels by women, as reported by other studies (McArthur et al. 2001; Satia et al. 2005; Lin and Yen 2008; Chen et al. 2012; Rimpeekool et al. 2017; Nieto et al. 2019). This could be at least partly explained by women's higher interest in healthy eating compared to men (Grunert et al. 2010). Moreover, women were found more likely to report higher interest in nutrition information (Cowburn and Stockley 2005; Drichoutis et al. 2006; Grunert and Wills 2007), a better understanding of food labels (Campos et al. 2011; Nieto et al. 2019), higher trust in nutrition labels, and higher influence of these labels on their food choices (Campos et al. 2011). It is, therefore, foreseeable that the female gender was also found in the current study to be associated with future intentions of purchasing fewer red-labelled products.

Arabs reported significantly higher NFT use and higher future intentions to purchase food according to both the red and the green FOPL compared to Jews. Differences in interest in nutrition information and nutrition label use by culture or by ethnicity had been documented in the literature (Grunert and Wills 2007; Chen et al. 2012; Nieto et al. 2019). For example, in an online survey (Nieto et al. 2019), American Latinos reported higher use of nutrition labels compared to White Americans. Other studies (Campos et al. 2011) had shown lower usage by minorities. Acquiescence response bias, which is due to a tendency of the respondents to agree with statements regardless of their "true" preference (Podsakoff et al. 2003), should be also considered, as this bias was found to be more common among Israeli Arabs compared to Israeli Jews (Baron-Epel et al. 2010). It is noteworthy that Arab adults, compared to Jews, have a higher prevalence of overweight and obesity and diet-related chronic diseases (such as diabetes and CHD), and report higher daily consumption of energy, total sugar, and sodium (ICDC 2019). It is, therefore, on one hand, encouraging, that they report higher usage of NFT and higher intentions of FOPL use; on the other hand, these findings and their context may warrant further educational interventions regarding the advantages of the new FOPL.

Usage of NFT was also associated with CHD prevalence and regularly engaging in physical activity. Other studies had demonstrated higher use of nutrition labels among chronically ill (McArthur et al. 2001; Campos et al. 2011) and specifically, CHD diagnosed (Williams and Mummery 2013) consumers, as well as among regularly exercising shoppers (Satia et al. 2005; Lin and Yen 2008; Rimpeekool et al.

2017). It is anticipated that people with chronic diseases, as well as with healthy behaviours, would be more conscious about the food they purchase. Nevertheless, they were not found in this study to have statistically higher intentions to purchase foods according to the new FOPL. A possible explanation might be that at the study time, when the new FOPL regulations were just implemented, these consumers were already using the NFT and did not perceive the benefits of the new labels. Moreover, as there were relatively few CHD cases in the sample, additional research targeted at CHD patients is warranted. Additional healthy behaviour that was associated in the literature (Satia et al. 2005; Lin and Yen 2008; Rimpeekool et al. 2017) with nutrition information use was smoking, with higher use among non-smokers. The current study did not demonstrate higher NFT use among non-smokers, but they were more likely to report intentions of purchasing fewer red-labelled products compared to smokers.

Overall, similarities in characteristics of those who use NFT and those who intend to use the new FOPL are to be expected. Of special interest are the differences reported for education and BMI. According to the literature (McArthur et al. 2001; Satia et al. 2005; Lin and Yen 2008; Chen et al. 2012; Nieto et al. 2019), higher education is associated with higher nutrition label use. Although this study was not able to replicate these findings regarding NFT use, lower education was associated with intentions of purchasing more green-labelled foods. This finding is supported by the literature, as Williams et al. (Williams and Mummery 2013) demonstrated greater use of "better for you" FOPL, a similar concept to the green-label in Israel, among males with lower education levels. As the NFT are perceived to be complicated to understand and use (Cowburn and Stockley 2005; Drichoutis et al. 2006; Grunert and Wills 2007; Campos et al. 2011), especially for the less educated shoppers (McArthur et al. 2001; Cowburn and Stockley 2005; Grunert and Wills 2007; Campos et al. 2011), several FOPL have been proposed to simplify the nutrition information to the consumers and help them make healthier food choices (van der Bend and Lissner 2019). Warning labels, similar to the red-label in Israel, were reported to be better understood than the NFT (Nieto et al. 2019). The use of products with a nutritional claim label, similar to the green-label concept, was shown to increase in all educational levels, especially among the less educated, resulting in reduction and even disappearance of educational differences (Lahti-Koski et al. 2012). Our findings also suggest that the new

FOPL may be more coherent to consumers with lower education and may even diminish nutrition-related health inequalities. Nevertheless, further research is still needed to validate the actual use of the new labels and to understand why lower education was associated only with intentions of green-label use.

The literature on the association between overweight and obesity and use of nutrition labels is inconsistent, with some studies showing that these consumers use nutrition labels more than normal-weight consumers (Satia et al. 2005; Williams and Mummery 2013), some show they use less (Rimpeekool et al. 2017), and others show no difference (Grunert et al. 2010; Chen et al. 2012; Nieto et al. 2019). In our research, BMI was not associated with NFT use but was positively correlated with future intentions to purchase fewer red-labelled and more green-labelled foods. Nutrition labels use has been found to affect purchasing behaviour, contribute to a better dietary intake, reduce consumption of unhealthy foods, and increase the dietary quality of consumers (Drichoutis et al. 2006; Campos et al. 2011). It was also associated with BMI reduction (Drichoutis et al. 2006). Therefore, our findings regarding BMI are encouraging, as they suggest that the new FOPL may potentially contribute to lowering the prevalence of overweight and obesity.

Of note, some criticism is pointed towards the FOPL approach, as it is traditionally based on nutrients advised not to be excessively consumed, instead of on the recommended overall diet (Visioli et al. 2021). The Israeli new red warning FOPL is indeed based on maximal threshold levels of specific nutrients. The green FOPL, on the other hand, attempts to integrate a more positive nutritional approach, as it is also based on the principles of the Mediterranean diet, with adjustments to Israeli dietary habits, taking into consideration the food's processing level and its health advantages (Gillon-Keren et al. 2020). Together, these two FOPL approaches balance the two different perspectives to nutritional education, as an attempt to improve the population's nutrition and health. In order to scrutinise this new public health policy, it is important to characterise consumers' attitudes towards each of these new FOPL separately, as was done in this research. Furthermore, future studies should examine changes in the quality of nutrition and health status associated with the use of these labels.

The present study has some limitations. First, the data collected were self-reported and subjected to information bias, including social desirability response bias, as mentioned earlier. However, this method is

commonly used and accepted in studies of nutrition label use, and the results of this study are in line with those presented in the literature. Furthermore, the prevalence of overweight and obesity in this study based on reported height and weight (49%) was similar to the prevalence that was calculated in another representative sample of the Israeli adult population based on measured anthropometrics (47%) (ICDC 2019). Second, the study was a cross-sectional survey and, therefore, cannot demonstrate causality. Third, self-reported intentions do not necessarily imply actual label use. On the other hand, this study is a national survey with a large and representative sample of respondents from both the Jewish and the Arab population groups. As the new FOPL regulations applied only to products that were manufactured or imported after 1 January 2020 (Knesset 2017), not all eligible products were indeed labelled during the time of the survey. Hence, inquiring on future intentions immediately after the implementation of the new FOPL was appropriate and allowed a comparison between the characteristics of NFT users and consumers with high intentions of using the new FOPL.

## Conclusions

Most of the Israeli population usually uses nutrition information, understands the aims of the red and green FOPL, approves of the new regulations, and intends to change its food buying habits according to the new labels. Moreover, it appears that some of the target groups that require dietary change but were not found to be associated with NFT use, including consumers with higher BMI and lower education, will possibly use the new FOPL more to improve their food purchases. Future research is needed to evaluate the actual new FOPL use and its impact on consumers' food choices and their nutrition and health.

## Disclosure statement

No potential conflict of interest was reported by the author(s).

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