

Prevalence of and Factors Associated with Nutrition Facts Panel Use among Young Adults in the National Capital Region, Philippines

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ABSTRACT

Objective. This study identified the prevalence of Nutrition Facts Panel (NFP) use. It determined the factors associated with NFP use among young adults aged 19-30 years old in the National Capital Region (NCR).

Methods. This analytical cross-sectional study collected data using a developed survey questionnaire. It was pre-tested to 32 respondents and administered online among young adults aged 19 to 30 years old residing in NCR at the time of the study, with a target sample size of 384. Convenience sampling was used to gather study participants. Nominal, ordinal, and interval data were summarized as frequencies and proportions. Mean and standard deviation were computed for ratio and interval data. Multiple logistic regression was used to test for the association to NFP use, reported as odds ratios.

Results. Study findings showed that the prevalence of NFP use among the respondents was 50.49% (95% CI: 44.64 – 54.81%). The factors found to be associated to NFP use were: 1) being a primary household food shopper (p-value= 0.029; OR: 1.67; 95% CI: 1.05–2.63), 2) having a special diet (p-value= 0.001; OR: 3.40; 95% CI: 1.62–7.14), 3) using nutritional supplements (p-value= 0.041; OR: 1.51; 95% CI: 1.02–2.25), 4) preparing food at home (p-value= 0.019; OR: 1.64; 95% CI: 1.08–2.49), and 5) engaging in physical activity (p-value< 0.001; OR: 2.05; 95% CI: 1.37–3.06) regularly.

Conclusion. The findings show the need for improved nutrition education and promotion, especially in the NFP. The study recommended improvement in the study methodology and nutrition education programs. It suggested several research areas and topics to be explored.

Keywords: nutrition labeling, diet, healthy, nutrition facts, young adults, factors

INTRODUCTION

Noncommunicable diseases (NCDs) account for 71% of annual deaths globally. Among the different NCDs, cardiovascular diseases are the most reported cause and are linked to risk factors such as tobacco use, physical inactivity, harmful alcohol use, and unhealthy diets.¹

In the Philippines, increasing trends in NCD risk factors were observed in the National Nutrition Survey (NNS). Particularly, there is a high prevalence of high waist circumference and waist-hip ratio linked to overweight and obesity, and high fasting blood sugar linked to diabetes. An increasing proportion of binge drinking among adults was also reported. Moreover, physical inactivity, a primary contributor to overweight and obesity, was prevalent among adolescents, especially females.² A recent study said that Filipino adults have an extremely poor diet quality

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characterized by high-risk cardiometabolic NCD indices associated with eating patterns of meat, sweetened beverages, rice, and fish.³

Considering its impact on global health, best buys interventions were proposed to reduce NCD risk factors and strengthen NCD management at a cost-effective condition. A specific objective for risk factors is the reduction of unhealthy diets, in which a primary proposal is to implement nutrition labeling.⁴

Nutrition Facts Panel (NFP) is a day-to-day tool for food decision-making presented on packaged foods and beverages labels.⁵ It is a standardized statement or listing of the nutrient content of a food.⁶ NFP use refers to a person's ability to obtain, translate, and use NFP information.⁷ There is no global prevalence information on NFP use found as of writing. This information is only reported from implemented studies on NFP use. In the Philippines, the 8th NNS reported that only 12.3% read the NFP.⁸ In a study among Filipino adults aged 18 to 59, the reported prevalence is 87.73%.⁹ The same study reported that the majority (43.26%) only sometimes referred to the NFP during every purchase, but most (32.12%) always do during first-time product purchases.⁹ In another study, 50.80% reported using the NFP during every food purchase.¹⁰ In terms of using the NFP to fit food product in the diet, only 44.50% affirmed but only mostly sometimes.^{9,10} Other than these data, no other information on NFP use in the country has been found.

Age, education level, and sex were the widely associated sociodemographic factors. Most studies consistently associated NFP use with those at least 30 years old,¹¹⁻¹⁶ with at least college level of education, and women.^{11,13,17-23} In terms of employment, most NFP users were employed,²⁴ had white-collar jobs,²⁵ and had high monthly incomes.^{16,19,21,22} Living in a suburban or rural area,¹⁴ and being married or separated^{9,11,26} also increases the likelihood of NFP use. Moreover, a household with less than four members¹⁴ and living with other people,²¹ especially with children,^{14,20} increase the likelihood of NFP use. In relation, being a primary household food shopper increases the frequency of NFP use.^{13,26,27} Lastly, those diagnosed with disease or risk factors,^{20,27,28} and with normal, obese, or overweight body mass index^{9,16,19,22} were most likely to use the NFP.

When it comes to lifestyle characteristics, engaging in physical activities regularly increases the likelihood of NFP use.^{9,19,29,30} Those whose goal is either to lose or control weight are also most likely to use the NFP.^{9,19} In addition, those who prepare food at home¹⁹ and have enough perceived time-spent shopping⁹ are most likely to use the NFP. In terms of the dietary characteristics, those with special diets, an interest in healthy eating,^{9,13,19,21} and nutritional supplement takers¹⁵ were most likely to use the NFP.

Considering the diverse information, the NFP can provide, its use can impact consumers' purchase decisions and food choices. Studying the aspects of NFP use is critical in really actualizing this. Hence, this study identified the

prevalence of NFP use and determined the factors associated with NFP use among young adults aged 19 to 30.

MATERIALS AND METHODS

Study Design

This study was a part of a research on the knowledge, beliefs, practices, and factors associated with Nutrition Facts Panel use among young adults aged 19 to 30 years old that employed an analytical cross-sectional design. Convenience sampling was employed to recruit participants. The sample size was calculated using OpenEpi v.3 at a confidence level of 95%, a margin of error of 5%, a design effect of 1.0, a power set at 80%, and an expected prevalence of 50.8%.¹⁰ An additional 22% was allocated for the occurrence of dropouts.⁹ Considering the time constraints in the conduct of the study, the prevalence-based sample size, 384, was used.

Study Participants

Young adulthood is a transition period associated with poor diet and rapid weight gain which is probably due to environmental, social, and lifestyle changes they encounter.³¹ Reviewed similar studies that focused on young adults used varying age ranges,^{19,30,32,33} but this study followed the convention of Zimmerman & Snow, 19 to 30 years old.³⁴ Other than the researcher's convenience, NCR was selected for its relatively young population and its current nutrition challenges, specifically the double burden of malnutrition in the form of undernutrition and overnutrition.³⁵ Hence, the study population was young adults aged 19 to 30 years old residing in the National Capital Region (NCR) at the time of the study implementation (from November to December 2021). No exclusion criteria were set for the respondents, although responses of those who did not meet the age criteria upon verification were withdrawn.

Data Collection

A survey questionnaire was developed for the study. The questionnaire draft was validated by experts and pretested by 32 young adults aged 19-30 years old residing in NCR. It included parts on personal characteristics, knowledge of NFP, beliefs, and practice on NFP use. It was mainly presented in English with a Filipino translation enclosed in parentheses. The Google Forms platform was used to administer it online. The survey link was disseminated through social media (i.e., Facebook, Twitter) and with the assistance of some organizations and institutions via electronic mail.

Study Variables

The survey covered questions on the respondents' sociodemographic, dietary, and lifestyle information. The sociodemographic characteristics included age, sex, marital status, education level, employment status, occupation, monthly income, and household size. The living situation was identified by asking "Are you living alone/ living with

children?” Their role in household food shopping was known by asking “Are you the primary household shopper?” Health status was recognized by asking “Are you currently diagnosed with a disease or a risk factor?”

The dietary characteristics were interest in healthy eating, diet status, and use of nutritional supplements. Interest in healthy eating was identified using the question “Are you interested in healthy eating (following the 10 Kumainments)?” whereas the diet status question was “Do you follow a special diet?” The use of nutritional supplements was known by the question “Are you taking any nutritional supplements daily?”

The lifestyle characteristics were food preparation, perceived time-spent shopping, physical activity, and weight goals. Food preparation was described using the question “Do you frequently (at least once a day) prepare food at home?” Perceived time-spent shopping was identified through the question “What is your perceived time-spent shopping?” answerable by either enough or limited. Their physical activity was characterized using the question “Do you engage in physical activity/exercise regularly?” In terms of their weight goals, the question “Are you currently trying to lose weight, maintain weight, gain weight, or nothing in particular?” was asked.

The prevalence of NFP use was measured through the responses to the question “do you use the Nutrition Facts Panel during the purchase of prepackaged foods for the first time?”

Data Analysis

Data processing was done through Microsoft Excel. The downloaded responses were initially checked for missing values and inconsistencies. Responses with these errors were invalidated and excluded from the analysis. Upon ensuring that all responses were valid, they were coded and analyzed using Stata. Nominal, ordinal, and interval data were summarized as frequencies and proportions. Ratio and interval data were reported using mean and standard deviation. NFP use was reported as frequency and point prevalence with the 95% confidence interval estimates. Multiple logistic regression using the backward elimination method at $\alpha=0.05$ was used to test for the association, reported as odds ratios, because NFP use is a dependent variable with two possible outcomes.

Ethical Considerations

The study was guided by the National Ethical Guidelines for Health Research 2017. It was registered to the University of the Philippines Manila Research Grants Administration Office (RGAO-2021-0679) and reviewed by the University’s Research Ethics Board (UPMREB 2021-416-01). The survey link was shared with a message stating the objectives, information confidentiality, and voluntary participation to initially inform the respondent. Upon accessing the link, formal informed consent was asked from them. The consent overviewed the study objectives, participation risks and benefits, survey duration, their rights as participants,

and contact information, in case of questions and concerns, and ended with a statement of consent stating voluntary participation in the study. Personal identifiers (e.g., names, nicknames, e-mail addresses) were not required to maintain confidentiality and anonymity. Furthermore, survey results were solely used for this study. No compensation and incentives were provided to the participants. However, it was explained that despite having no direct benefit, their participation significantly contributes to studying the NFP.

RESULTS

A total of 491 respondents participated in the actual survey. Through the screening questions for age, current residence, and whether they have previously answered a similar survey within three months, 70 respondents were excluded. Fifteen accomplished forms were invalidated because of vague and incomplete responses, thus, only 406 (82.68%) respondents were considered for further analysis.

Characteristics of Respondents

The characteristics of the respondents are summarized in Table 1. Most of the respondents were female, either college graduates or graduates, unemployed, not primary food shoppers, and not diagnosed with any disease or risk factor. The dietary characteristics of most respondents were interested in healthy eating, not following any special diet, and not taking nutrition supplements regularly. In terms of lifestyle characteristics, most respondents prepared food at home regularly, did not engage in any physical activity regularly, and wanted to lose weight.

Prevalence of NFP Use

Results showed that the prevalence of NFP use among the respondents was 50.49% (95% CI: 44.64 – 54.81%), whereas non-use was 49.51% (95% CI: 45.62 – 55.36%).

Table 1 presents the prevalence of NFP use in terms of the factors. The mean ages of NFP users and non-users were comparable at 23.36 (sd=3.04) and 23.85 (sd=3.00) years old, respectively. More females were NFP users than males. Moreover, most NFP users were either college undergraduates or graduates, single, or belong to a household with at least four members. Most NFP users were unemployed. Among those employed, most NFP users have professional occupations and a monthly income between PHP 21,914.01 and 43,828.00. Also, most respondents who were NFP users were not diagnosed with a disease or a risk factor. Furthermore, most of them were living with others but not with children, and were not primary food shoppers in their household. Most respondents who use the NFP expressed interest in healthy eating, did not follow any special diet, and did not use nutritional supplements regularly. In terms of lifestyle, most NFP users among the respondents regularly prepared food at home, engaged in physical activity, and aimed to lose weight. Among the NFP users who were primary food

Table 1. Crude Association of the Factors on Nutrition Facts Panel (NFP) Use of the Young Adult Respondents Aged 19 to 30 (n=406) of the Study on Knowledge, Beliefs, Practices, and Factors Associated to NFP

Factor	Frequency	%	NFP users (%) n=205	NFP non-users (%) n=201	Odds ratio (95% CI)	p-value
A. Sociodemographic						
Age	23.61 (s=3.03)		23.36 (sd= 3.04)	23.85 (sd= 3.00)	1.06 (0.99 – 1.13)	0.103
Sex (n=400)						
Female	259	63.79	125 (48.26)	134 (51.74)	0.80 (0.53 – 1.20)	0.282
Male	141	34.73	76 (53.90)	65 (46.10)		
Education level						
Postgraduate	41	10.10	25 (60.98)	16 (39.02)	1.30 (0.34 – 4.99)	0.700
College graduate	151	37.19	76 (50.33)	75 (49.67)	0.84 (0.25 – 2.89)	0.787
College undergraduate	198	48.77	96 (48.48)	102 (51.52)	0.78 (0.23 – 2.65)	0.696
Technical/ vocational course graduate	5	1.23	2 (40.00)	3 (60.00)	0.56 (0.06 – 4.76)	0.592
Below college undergraduate	11	2.71	6 (54.55)	5 (45.45)		
Marital status						
Married	16	96.06	9 (56.25)	7 (43.75)	1.27 (0.46 – 3.48)	0.639
Single	390	3.94	196 (50.26)	194 (49.74)		
Employment status						
Employed	175	43.10	94 (53.71)	81 (46.29)	1.25 (0.85 – 1.86)	0.259
Unemployed	231	56.90	111 (48.05)	120 (51.95)		
Occupation (n=175)						
Manager	15	8.57	10 (66.67)	5 (33.33)	1.00 (0.17 – 5.77)	1.000
Professional	139	79.43	72 (51.80)	67 (48.20)	0.54 (0.13 – 2.23)	0.393
Technicians and associate professionals	12	6.86	6 (50.00)	6 (50.00)	0.50 (0.08 – 2.99)	0.448
Clerical support workers, service and sales workers, craft and related trades workers, elementary occupations	9	5.14	6 (66.67)	3 (33.33)		
Monthly Income (n=175)						
> Php 76,699.00	11	6.29	7 (63.64)	4 (36.36)	1.40 (0.23 – 8.46)	0.714
Php 43,828.01 – 76,699.00	41	23.43	22 (53.66)	19 (46.34)	0.93 (0.22 – 3.95)	0.918
Php 21,914.01 – 43,828.00	73	41.71	38 (52.05)	35 (47.95)	0.87 (0.22 – 3.50)	0.843
Php 10,957.00 – 21,914.00	41	23.43	22 (53.66)	19 (46.34)	0.93 (0.22 – 3.95)	0.918
< Php 10,957.00	9	5.14	5 (55.56)	4 (44.44)		
Household size						
	5.05 (sd=2.10)		4.98 (sd= 1.92)	5.13 (sd= 2.27)		
Less than four members	88	21.37	43 (48.86)	45 (51.14)	0.92 (0.57 – 1.48)	0.730
Four or more members	318	78.33	162 (50.94)	156 (49.06)		
Health status						
Currently diagnosed with a disease or a risk factor	65	16.01	38 (58.46)	27 (41.54)	1.47 (0.86 – 2.51)	0.162
Not diagnosed with a disease or a risk factor	341	83.99	167 (48.97)	174 (51.03)		
Living situation						
Living with others	399	98.28	202 (50.63)	197 (49.37)	1.37 (0.30 – 6.19)	0.685
Living alone	7	1.72	3 (42.86)	4 (57.14)		
Living with children (n=399)						
Lives with children	129	32.33	64 (49.61)	65 (50.39)	0.94 (0.62 – 1.43)	0.779
Does not live with children	270	67.67	138 (51.11)	132 (48.89)		
Role in household food shopping						
Primary food shopper	100	24.63	60 (60.00)	40 (40.00)	1.67 (1.05 – 2.63)	0.029
Not a primary food shopper	306	75.37	145 (47.39)	161 (52.61)		

Table 1. Crude Association of the Factors on Nutrition Facts Panel (NFP) Use of the Young Adult Respondents Aged 19 to 30 (n=406) of the Study on Knowledge, Beliefs, Practices, and Factors Associated to NFP (continued)

Factor	Frequency	%	NFP users (%) n=205	NFP non-users (%) n=201	Odds ratio (95% CI)	p-value
B. Dietary						
Interest in healthy eating						
Interested	375	92.36	194 (47.78)	181 (44.58)	1.95 (0.91 – 4.18)	0.087
Not interested	31	7.64	11 (2.71)	20 (4.93)		
Diet status						
With a special diet	41	10.10	31 (75.61)	10 (24.39)	3.40 (1.62 – 7.14)	0.001
Without a special diet	365	89.90	174 (47.67)	191 (52.33)		
Use of nutritional supplements						
User of nutritional supplements	168	41.38	95 (56.55)	73 (43.45)	1.51 (1.02 – 2.25)	0.041
Non-user of nutritional supplements	365	58.62	110 (46.22)	128 (53.78)		
C. Lifestyle						
Food preparation						
Prepares food at home regularly	269	66.26	147 (54.65)	122 (45.35)	1.64 (1.08 – 2.49)	0.019
Does not prepare food at home regularly	137	33.74	58 (42.34)	79 (57.66)		
Perceived time-spent shopping (n=100)						
Enough	79	79.00	48 (60.76)	31 (39.24)	1.16 (0.44 – 3.08)	0.764
Limited	21	21.00	12 (57.14)	9 (42.86)		
Physical activity						
Engages in physical activity regularly	231	56.90	106 (60.57)	69 (39.43)	2.05 (1.37 – 3.06)	<0.001
Does not engage in physical activity regularly	175	43.10	99 (42.86)	132 (57.14)		
Weight goals						
Lose weight	179	44.09	95 (53.07)	84 (46.93)	1.49 (0.89 – 2.49)	0.130
Gain weight	91	22.41	24 (50.00)	24 (50.00)	1.32 (0.65 – 2.66)	0.446
Maintain weight	88	21.68	48 (52.75)	43 (47.25)	1.47 (0.81 – 2.65)	0.201
Nothing in particular	48	11.82	38 (43.18)	50 (56.82)		

shoppers, most of them reported having enough perceived time-spent shopping.

Factors Associated with NFP Use

The results of the association for each factor are presented in Table 1. Among the sociodemographic factors, only being a primary household food shopper showed a significant association with NFP use (p-value= 0.029; OR:1.67; 95% CI: 1.05–2.63). In terms of the dietary factors, having a special diet (p-value= 0.001; OR:3.40; 95% CI: 1.62–7.14) and using nutritional supplements (p-value= 0.041; OR:1.51; 95% CI: 1.02–2.25) were significantly associated. The lifestyle factors that are significantly associated with NFP use were preparing food at home (p-value= 0.019; OR:1.64; 95% CI: 1.08–2.49) and engaging in physical activity (p-value< 0.001; OR:2.05; 95% CI: 1.37–3.06) regularly.

Controlling for other variables, only engaging in physical activity remained as a significant predictor of NFP use. Hence, the odds of NFP use among the respondents were 1.85 (95% CI: 1.19–2.89) times higher among those who engage in physical activity regularly than those who do not.

DISCUSSION

Prevalence of NFP Use

The estimated prevalence of NFP use at 50.49% (95% CI: 44.64 – 54.81%) in this study was similar to 50.80% of NFP use during every food purchase of a related local study.¹⁰ However, it is lower than the reported prevalence of another local study, 87.73%.⁹ These observations may be due to several reasons. First, this study covered an age group similar to that of Lopez and younger than Sy and Bullecer.^{9,10} As reported in other studies, those aged at least 30 are more likely to be NFP users.^{11–16} An explanation is that older adults are more health-conscious and more likely to manage chronic conditions. Hence, they are more willing to change their behavior for better health and quality of life, such as using the NFP.³⁶ Second, similar to the study by Lopez, this study was limited to a highly urbanized area, whereas Sy and Bullecer focused on a rural area.^{9,10} According to another study, those living in suburban and rural areas use the NFP more than those in urban areas.¹⁴ This may be explained by the lifestyle of urban people. Considering their fast-paced lifestyle, they have less time to read foods' NFP.⁹ Third, the majority (89.32%) of the respondents of Sy and Bullecer were females.⁹ Many studies have associated NFP

use with women, which may explain the high prevalence reported.^{9,11,12,14,15,17,20,21,25,26,30,37,38}

Although the studies by Lopez, and Sy and Bullecer have comparable sample sizes to this study, the data collection method varied, which may also explain the observations.^{9,10} Lopez implemented a self-administered survey online and paper-based, whereas Sy and Bullecer did face-to-face interviews.^{9,10} Since nutrition label use is a favorable practice, the respondents in face-to-face data collection may be more likely to report a positive response. Hence, a social desirability bias can be observed.³⁹ Although this bias may still affect the results of this study, it was further minimized through the online implementation of the self-administered survey with little to no interaction with the researcher.

Factors Associated with NFP Use

The following factors showed significant association with NFP use: being a primary food shopper, having a special diet, use of nutritional supplements, preparing food at home regularly, and engaging in physical activity regularly. Upon controlling for confounders, the remaining factor associated with NFP use was engaging in regular physical activity.

Primary food shoppers are more likely to use the NFP than those who are not.^{13,26,27} Considering that they are highly involved in food selection and purchase, they have a higher chance of referring to the NFP than those who do not shop. Moreover, food shopping is primarily done by the head of the household, usually the parents. Hence, they use the NFP in food selection to purchase nutritious and healthy foods for the family, especially their children.

Those preparing food at home regularly are also more likely to use the NFP.¹⁹ This may be attributed to the mindset of people preferring home-cooked meals to keep themselves healthy. Frequent cooking of dinner at home is associated with a healthier diet.⁴⁰ Thus, they use the NFP in food selection and purchase to maintain a healthy diet. Those who engage in physical activity regularly are more likely to be NFP users.^{9,19,29,30} Similar to preferring home-cooked meals, regular physical activity contributes to a healthy lifestyle which also influences food consumption decisions where the NFP can be a guide.

Those following a special diet are more likely to use the NFP than those who do not.^{9,13,21} In addition, users of nutrition supplements are more likely to use the NFP than those who do not.¹⁵ These observations may be attributed to people's health consciousness. Health-conscious people tend to be more selective about their foods; thus, they use the NFP as a guide.

Despite the statistical significance and insignificance resulting from the analysis of the gathered data, it should be noted that it comes with various limitations. Non-probability sampling was used to recruit respondents which affected the representativeness of the population. In relation, the sample size used has a similar effect. Some variables have high computed minimum sample sizes that cannot be

attained within the allotted time for study implementation. Furthermore, there is limited information on some variables that did not permit the computation of minimum sample size. For the variables in these cases, the statistical analyses have low power affecting the generalizability of the results. Moreover, the factors studied were only based on the reviewed studies implying that other relevant factors not found in the search were not covered.

Limitations

Since the study was implemented during the pandemic, the data collection was solely implemented online, limiting the potential respondents to those with access and knowledge of the Internet and Google Forms. Selection bias was minimized by limiting the age range and region of residence of the respondents to 19-30 years old and NCR, respectively. Moreover, non-probability sampling was used to recruit respondents affecting the representativeness of the population which lowered the statistical power affecting the generalizability of the population. To minimize this, coordination of verified Facebook groups and selected organizations were secured for survey dissemination. Nonetheless, these limitations were considered in interpreting and generalizing the study's results.

CONCLUSION AND RECOMMENDATIONS

The prevalence of NFP use among the respondents was 50.49% (95% CI: 44.64 – 54.81%). The factors significantly associated with NFP use were 1) being a primary household food shopper (p-value= 0.029; OR:1.67; 95% CI: 1.05–2.63), 2) having a special diet (p-value= 0.001; OR:3.40; 95% CI: 1.62–7.14), 3) using nutritional supplements (p-value= 0.041; OR:1.51; 95% CI: 1.02–2.25), 4) preparing food at home (p-value= 0.019; OR:1.64; 95% CI: 1.08–2.49), and 5) engaging in physical activity (p-value< 0.001; OR:2.05; 95% CI: 1.37–3.06) regularly. The results imply the need to focus on improving nutrition education and promotion guided by the identified factors. Despite the lack of statistical significance of the other variables, they should still be considered as they can still influence NFP use. Groups with lower likelihood of using the NFP should be prioritized for these nutrition education and promotion drives. Moreover, consider the primary food shoppers as a target group for nutrition education and leverage their influence on other family members.

Identified research areas that need exploring include the effects of the COVID-19 pandemic on NFP use and developing a standardized tool for knowledge and prevalence of NFP use among Filipino young adults. Implementing a similar study across other age groups and areas should also be considered. Moreover, NFP format standards may be revisited. Specifically, studies identifying the necessary changes, especially to the design of the NFP, that may address its non-use and difficulty of use should be implemented.

Laymanizing and simplifying the NFP, such as incorporating color codes and icons, should be explored to make it more user-friendly, especially for the non-technical population. In relation, looking at adapting the NFP formats of other countries may also be reviewed.

Disclaimer

The views expressed in the submitted article are the authors' own and not an official position of the institution or funder.

Statement of Authorship

NAEL contributed in the conceptualization of work, acquisition and analysis of data, drafting and revising, and final approval of the version to be published; ERB contributed in the conceptualization of work, drafting and revising, and final approval of the version to be published.

Author Disclosure

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REFERENCES

- World Health Organization. Noncommunicable diseases [Internet]. 2021 [cited 2022 Aug 29]. Available from: <https://www.who.int/news-room/fact-sheets/detail/noncommunicable-diseases>
- Department of Science and Technology - Food and Nutrition Research Institute (DOST-FNRI). Philippine Nutrition Facts and Figures: 2018 Expanded National Nutrition Survey (ENNS). FNRI Bldg., DOST Compound, Gen. Santos Avenue, Bicutan, Taguig City, Metro Manila, Philippines; 2020.
- Angeles-Agdeppa I, Sun Y, Tanda KV. Dietary pattern and nutrient intakes in association with non-communicable disease risk factors among Filipino adults: a cross-sectional study. *Nutr J*. 2020 Aug;19(1):79. doi: 10.1186/s12937-020-00597-x.
- World Health Organization. Tackling NCDs: "best buys" and other recommended interventions for the prevention and control of noncommunicable diseases [Internet]. World Health Organization. 2017 [cited 2022 Aug 29]. Available from: <https://apps.who.int/iris/handle/10665/259232>
- Food and Drug Administration. Understanding and using the nutrition facts label. 2020.
- Food & Drug Administration. Administrative Order No. 2014-0030 Revised rules and regulations governing the labeling of prepackaged food products further amending certain provisions of Administrative Order No. 88-B s. 1984 or the Rules and regulations governing the labeling of pre-p. 2014.
- Zainol Z, Yahaya R, Osman J, Omar NA. The effect of health knowledge, nutrition label use and attitude towards nutrition label on healthy food choice among Malaysian consumer. *Int J Acad Res Bus Soc Sci*. 2019;9(9):1327-52. doi: 10.6007/IJARBS/v9-i9/6467
- DOST-FNRI. Philippine nutrition facts and figures 2015: Updating of nutritional status of Filipino children and other population groups overview. FNRI Bldg., DOST Compound, Gen. Santos Avenue, Bicutan, Taguig City, Metro Manila, Philippines; 2016.
- Sy DC, Bullecce ER. Prevalence and factors associated with nutrition label use among selected Filipino adults. *Acta Med Philipp*. 2020;54(5):612-9. doi: 10.47895/amp.v54i5.2269
- Lopez NAE. Knowledge, attitude, and practice of College of Home Economics (CHE) undergraduate students on nutrition facts panel use. [Quezon City]: College of Home Economics, University of the Philippines Diliman; 2018.
- Blitstein JL, Evans WD. Use of nutrition facts panels among adults who make household food purchasing decisions. *J Nutr Educ Behav*. 2006 Nov-Dec;38(6):360-4. doi: 10.1016/j.jneb.2006.02.009.
- Christoph MJ, An R, Ellison B. Correlates of nutrition label use among college students and young adults: A review. *Public Health Nutr*. 2016 Aug;19(12):2135-48. doi: 10.1017/S1368980015003183.
- Drichoutis AC, Lazaridis P, Nayga RM. Nutrition knowledge and consumer use of nutritional food labels. *Eur Rev Agric Econ*. 2005 Mar;32(1):93-118. doi: 10.1093/erae/jbi003
- Govindasamy R, Italia J. Evaluating consumer usage of nutritional labeling: The influence of socio-economic characteristics. *New Jersey Agric Exp Stn*. 1999;24. doi: 10.22004/ag.econ.36734
- Misra R. Knowledge, attitudes, and label use among college students. *J Am Diet Assoc*. 2007 Dec;107(12):2130-4. doi: 10.1016/j.jada.2007.09.001.
- Wilson MD, Ramirez AS, Arsenault JE, Miller LMS. Nutrition label use and its association with dietary quality among Latinos: the roles of poverty and acculturation. *J Nutr Educ Behav*. 2018 Oct;50(9):876-87.
- Besler HT, Buyuktuncer Z, Uyar MF. Consumer understanding and use of food and nutrition labeling in Turkey. *J Nutr Educ Behav*. 2012 Nov-Dec;44(6):584-91. doi: 10.1016/j.jneb.2012.01.005.
- Cavaliere A, De Marchi E, Banterle A. Does consumer health-orientation affect the use of nutrition facts panel and claims? An empirical analysis in Italy. *Food Qual Prefer*. 2016 Dec;54:110-6. doi: 10.1016/j.foodqual.2016.07.008
- Christoph MJ, Larson N, Laska MN, Neumark-Sztainer D. Nutrition Facts Panels: Who uses them, what do they use, and how does use relate to dietary intake? *J Acad Nutr Diet*. 2018 Feb 1;118(2):217-28. doi: 10.1016/j.jand.2017.10.014.
- De la Cruz-Góngora V, Villalpando S, Rodríguez-Oliveros G, Castillo-García M, Mundo-Rosas V, Meneses-Navarro S. Use and understanding of the nutrition information panel of pre-packaged foods in a sample of Mexican consumers. *Salud Publica Mex*. 2012 Mar-Apr;54(2):158-66. doi: 10.1590/s0036-36342012000200012.
- Guthrie JF, Fox JJ, Cleveland LE, Welsh S. Who uses nutrition labeling, and what effects does label use have on diet quality? *J Nutr Educ*. 1995 Jul-Aug;27(4):163-72. doi: 10.1016/S0022-3182(12)80422-5
- Laz TH, Rahman M, Berenson AB. Association of frequent use of food labels with weight loss behaviors among low-income reproductive-age women. *J Am Coll Nutr*. 2015;34(1):73-9. doi: 10.1080/07315724.2014.891957.
- Song J, Huang J, Chen Y, Zhu Y, Li H, Wen Y, et al. The understanding, attitude and use of nutrition label among consumers (China). *Nutr Hosp*. 2015 Jun;31(6):2703-10. doi: 10.3305/nh.2015.31.6.8791.
- Kollanoor-Samuel G, Segura-Pérez S, Shebl FM, Hawley NL, Damio G, Chhabra J, et al. Nutrition Facts Panel use is associated with diet quality and dietary patterns among Latinos with type 2 diabetes. *Public Health Nutr*. 2017 Nov;20(16):2909-19. doi: 10.1017/S1368980017001860.
- Bryla P. Who reads food labels? Selected predictors of consumer interest in front-of-package and back-of-package labels during and after the purchase. *Nutrients*. 2020 Aug;12(9):2605. doi: 10.3390/nu12092605.
- Shahrabani S. Determinants of Israeli consumers' decision to use food label information more frequently: a national survey study. *Isr J Health Policy Res*. 2021 Mar;10(1):25. doi: 10.1186/s13584-021-00462-0.
- Zhang J, Zhai L, Osewe M, Liu A. Analysis of factors influencing food nutritional labels use in Nanjing, China. *Foods*. 2020 Dec;9(12):1796. doi: 10.3390/foods9121796.

28. Cook LA, Burton S, Howlett E. Health risk factors and their effect on consumers' use of Nutrition Facts Panels. *J Consum Aff*. 2011 Sep;45(3):516–27. doi: 10.1111/j.1745-6606.2011.01215.x
29. Bleich SN, Wolfson JA. Differences in consumer use of food labels by weight loss strategies and demographic characteristics. *BMC Public Health*. 2015 Dec;15:1275. doi: 10.1186/s12889-015-2651-z.
30. Sharf M, Sela R, Zentner G, Shoob H, Shai I, Stein-Zamir C. Figuring out food labels. Young adults' understanding of nutritional information presented on food labels is inadequate. *Appetite*. 2012 Apr;58(2):531–4. doi: 10.1016/j.appet.2011.12.010.
31. Winpenny EM, van Sluijs EMF, White M, Klepp KI, Wold B, Lien N. Changes in diet through adolescence and early adulthood: longitudinal trajectories and association with key life transitions. *Int J Behav Nutr Phys Act*. 2018 Sep;15(1):86. doi: 10.1186/s12966-018-0719-8.
32. Buyuktuncer Z, Ayaz A, Dedebyraktar D, Inan-Eroglu E, Ellahi B, Besler HT. Promoting a healthy diet in young adults: the role of nutrition labelling. *Nutrients*. 2018 Sep;10(10):1335. doi: 10.3390/nu10101335.
33. Hobin E, Shen-Tu G, Sacco J, White C, Bowman C, Sheeshka J, et al. Comprehension and use of nutrition facts tables among adolescents and young adults in Canada. *Can J Diet Pract Res*. 2016 Jun;77(2): 59–65. doi: 10.3148/cjdpr-2015-042.
34. Zimmerman M, Snow B. *An Introduction to Nutrition* [eTextbook]. 2012 [cited 2021 May 2]. Available from: <https://open.umn.edu/opentextbooks/textbooks/an-introduction-to-nutrition>.
35. National Nutrition Council. NCR Profile [Internet]. 2020 [cited 2021 May 2]. Available from: <https://www.nnc.gov.ph/2-uncategorised/244-ncr-profile>
36. Drewnowski A, Evans WJ. Nutrition, physical activity, and quality of life in older adults: summary. *J Gerontol A Biol Sci Med Sci*. 2001 Oct;56(Spec No 2):89–94.
37. Hastak M, Mitra A, Ringold DJ. Do consumers view the nutrition facts panel when making healthfulness assessments of food products? Antecedents and consequences. *J Consum Aff*. 2020 Mar;54(2): 395–416. doi: 10.1111/joca.12301
38. Marietta AB, Welshimer KJ, Anderson SL. Knowledge, attitudes, and behaviors of college students regarding the 1990 Nutrition Labeling Education Act food labels. *J Am Diet Assoc*. 1999 Apr;99(4): 445–9. doi: 10.1016/s0002-8223(99)00108-x.
39. Callegaro M. Social Desirability. In: Lavrakas P, editor. *Encyclopedia of Survey Research Methods*, 1st ed. California: Sage Publications, Inc.; 2008. pp. 825–826.
40. Wolfson JA, Bleich SN. *Public Health Nutr*. 2015 Jun;18(8): 1397–406. doi: 10.1017/S1368980014001943.