

بسم الله الرحمن الرحيم



Palestine Polytechnic University
College Of Medicine And Health Sciences
Healthy And Therapeutic Nutrition
Graduation project

The knowledge and awareness of university students in reading food labels : A cross-sectional study in Hebron- Palestine

By

YamamaHroub

Ameera Alherbawi

MunaHashlamoun

MaramDawoud

This Thesis is submitted in a partial fulfillment of the requirements for graduation project of Healthy and Therapeutic Nutrition at Palestine Polytechnic University.

Supervisor:

Ms.IsraaSharif

Hebron

2021

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

:

هَلْ يَسْتَوِي الَّذِينَ يَعْلَمُونَ وَالَّذِينَ لَا يَعْلَمُونَ إِنَّمَا يَتَذَكَّرُ أُولُو الْأَلْبَابِ

صدق الله العظيم

..آية ()

الاهداء

... ..
.. نبي الرحمة ونور العالمين
سيدنا محمد صلى الله عليه وسلم .
الى أهل المحبة والعطاء و يا من أحببتهم القلوب ..
الى من علمنا العزيمة والإصرار ..
الى نبع الدفاء والعطاء الغالية امي ...
...
الى كل من ساندني ودعمني ، وقدم لي اهتماماته ..
اليكم جميعا أهدي هذا العمل المتواضع

شكر وتقدير

أشكر الله الذي من علي بإتمام هذا العمل المتواضع ، مع رجائي أن يتقبله مني ويجعله خالصة لوجهه الكريم ، وانطلاقاً من قوله تعالى : (ومن يشكر الله فأبما يشكر نفسه) و إيماننا بفضل الاعتراف بالجميل وتقديم الشكر والامتنان لأصحاب المعروف ، فأني أتقدم بالشكر الجزيل ، والثناء لكل من ساعدني في انجاح هذا العمل المتواضع .

واخص بالذكر الاستاذة إسراء الشريف مشرفة الموضوع واسأل الله العلي القدير أن يكون هذا عمل خالصاً لوجهه وأن يجعله علماً نافعا ويسهل لي به طريقة الى الجنة .

ABSTRACT

Background: Food labels are a tool to promote public health by providing information which allows consumers to make informed dietary choices. At the same time, food labels may represent a marketing tool and may influence consumers' perception of food quality .

Objectives:

The main objective of this study is to determine the awareness of male and female students in reading Food Label at Palestine Polytechnic University . Moreover, to find the relationship between reading food labels with gender, BMI and university specialization.

Methods:

This study is a cross-sectional study, conducted on students of Palestine Polytechnic University in Hebron from all faculties, and a questionnaire was made on Google Form and distributed to the groups of the university. The questionnaire consists of three sections: Section A included the demographic information of the participants, and Section B included the information Section C includes questions related to eating healthy and daily habits regarding assessment of awareness and knowledge of food labels. Data analysis will be performed using spss software.

Results:

The result showed that 150 participants participated to respondent the questionnaire, The average age for a participants was 20.4 , 34 of them were males and 116 were females . The total knowledge was 55.5% that means that the total level of knowledge was moderate knowledge , and the average of total awwerance was 3.21 , it was a positive attitudes . The result showed that 66% of participants were normal BMI , and There was no significant relationship between the BMI of the students and reading food labels, but there was a significant difference between the students who were reading food label according to the gender, and also there was a significant difference

between the students who were reading food label according to their collage (94% of students in collage of medicine and health sciences were reading food labels) . There was no significant difference between healthy eating habits of students according to reading food labels , and There was no significant difference between the attitudes of the students according to the food labels with the BMI , also There was no significant difference between the attitudes of the students according to the food labels to their gender and also according to the food labels to their collage .

Conclusion :

According to study of the level of awareness and knowledge of reading food labels , it was acceptable, especially for their knowledge of nutritional information related to food labels and for their behavior towards reading food labels, it is considered good to moderate, but there was no direct relationship linking these behaviors with private information. With students, though, this level can be improved much further by trying to spread awareness of reading food labels in PPU.

: الملصقات الغذائية هي أداة لتعزيز الصحة العامة من خلال توفير المعلومات التي تتيح للمستهلكين اتخاذ خيارات غذائية مستنيرة. في الوقت نفسه ، قد تمثل الملصقات الغذائية أداة تسويقية وقد تؤثر على المستهلكين لجودة الطعام.

الهدف

الهدف الرئيسي من هذه الدراسة هو معرفة مدى وعي الطلاب والطالبات بقراءة ملصقات الطعام في جامعة بوليتكنك فلسطين.

الاهداف الفرعية:

- إيجاد العلاقة بين قراءة ملصقات الطعام والجنس.

- معرفة العلاقة بين قراءة ملصقات الطعام والتخصص

طريقة

هذه الدراسة عبارة عن دراسة مقطعية ، يتم إجراؤها على طلاب جامعة بوليتكنك فلسطين في الخليل من جميع الكليات ، وتم عمل استبيان على جوجل فورم وتم توزيعه على قروبات الجامعة ويتكون الاستبيان من ثلاثة : القسم أ تضمن المعلومات الديموغرافية للمشاركين ، القسم ب تضمن المعلومات المتعلقة بتناول العادات الصحية واليومية ، القسم ج متضمن أسئلة حول تقييم الوعي والمعرفة بملصقات الطعام .

وأظهرت النتائج أن مشاركا شاركوا في الاستبيان ، وبلغ متوسط عمر المشاركين . منهم

، وكان ذلك بمثابة مواقف إيجابية. أظهرت النتيجة أن % من المشاركين كانوا طبيعياً بمؤشر كتلة الجسم ، ولم تكن هناك علاقة ذات دلالة إحصائية بين الملصقات الغذائية ، ولكن كان هناك فرق كبير بين الطلاب الذين كانوا يقرؤون ملصق الطعام وفقاً للجنس ، وأيضاً. كان هناك فرق كبير بين الطلاب الذين كانوا يقرؤون ملصقات الطعام وفقاً لمجموعتهم (الطلاب في كلية الطب والعلوم الصحية كانوا يقرؤون ملصقات الطعام). لا توجد فروق ذات دلالة إحصائية بين عادات الأكل الصحية لدى الطلاب حسب قراءة الملصقات الغذائية ، ولا يوجد فرق معنوي بين اتجاهات الطلاب حسب ملصقات الطعام مع مؤشر كتلة الجسم ، كما لا يوجد فرق معنوي بين اتجاهات الطلاب. الطعام حسب جنسهم وأيضاً وفقاً لملصقات الطعام في مجتمعاتهم.

التلخيص :

حسب دراسة مستوى الوعي والمعرفة بقراءة الملصقات الغذائية ، فقد كان مقبولاً ، خاصة بالنسبة لمعرفتهم بالمعلومات الغذائية المتعلقة بملصقات الطعام وسلوكهم تجاه قراءة ملصقات الطعام ، فهي تعتبر جيدة إلى معتدلة ، لكن لم يكن هناك علاقة مباشرة تربط هذه السلوكيات بالمعلومات الخاصة بالطلاب ، على الرغم من ذلك ، يمكن تحسين هذا المستوى بشكل أكبر من خلال محاولة نشر الوعي بقراءة ملصقات الطعام في جامعة بوليتكنك فلسطين.

Table of Contents

الإهداء	iii
شكر وتقدير	iv
Introduction	1
Background	1
The importance of food labels.....	1
.Food label sections and their components.....	2
Fat.....	3
Cholesterol	3
Fiber	4
Objectives.....	4
Main Objective.....	4
Specific objectives.....	4
Research Question.....	5
Research Hypothesis	5
Literature Review	6
Methodology	13
Study design	13
Study location.....	13
Study population	13
Inclusion criteria.....	13
Exclusion criteria.....	13
Study Instruments.....	13
Questionnaire design and layout	14
Data Collection.....	14
Data Analysis	15
Results	16
Sample Characteristics (Socio-demographic Data).....	16
Nutrition assessment	18
Discussion	33
Limitations :	37
Recommendation.....	37
Conclusion.....	38
References	39

List of tables

Table(2.1) : Summary of the studies.....	10
Table (4.1): Sample characteristic	17
(Table 4.2):Anthropometric Data	18
(Table 4.3): Percentage of categories of BMI	18
(Table 4.4): Correlation between BMI and Reading food label.....	21
Table (4.5):Nutrition assessment	23
Table (4.6): Assessment of knowledge and awareness of reading food labels	24
Table (4.7): Participants knowledge (N=150 participants)	25
Table (4.8): Awareness	26
Table (4.9): Correlation between Gender and Reading food label.....	27
Table (4.10): Correlation between Collage and Reading food label	28
Table (4.11): Correlations between healthy eating habits and reading food label.....	28
Table (4.12):Correlation between the attitudes of the students according to the food labels with the BMI	30
Table (4.13): Correlation between attitudes of the students according to the food labels and their gender.....	31
Table (4.14):Correlation between attitudes of the students according to the food labels and their collage.....	32

List of figures

(Figure 4.1): Percentage of BMI.....	19
(Figure 4.2): Overall knowledge scores of participants (n = 149, one participant did not respond).....	25

LIST OF ABBREVIATION

FDA	Food and Drug Administration
GrGram	
%DV	Percent Daily Value
HDL	high-density lipoproteins
LDL	low-density lipoproteins
VLDL	very low-density lipoproteins
CHO	carbohydrate

1. Introduction

1.1. Background

Food labels are a tool to promote public health by providing information which allows consumers to make informed dietary choices. At the same time, food labels may represent a marketing tool and may influence consumers' perception of food quality. (Martini , 2020)

The history of food label

Food Label was established in 1906 under the Pure Food and Drug Act, the United States was the first country to enact mandatory food labels in 1913, and the US Food and Drug Administration made some amendments in 1990 to include food labels on the amount of calories, fat, cholesterol, and sodium. Carbohydrates, protein, plus a selection of vitamins and minerals, and in 2019 food labels underwent an important update for the first time in 25 years. (Skrovan , 2017)

1.1.1. The importance of food labels

1- It helps consumers make informed choices about the food they buy, helps them store and use it safely, and allows people to plan when they'll consume them - all of which helps reduce food waste . (Martinelli, 2018)

2- The labels help you understand a food's composition of vitamins, minerals, calories and fats and this information is essential to ensuring that you are eating the types of food that are right for a person. (WHEELER , 2019)

- 1- Screening for ingredients that can cause a person to have harmful reactions, including the most common food allergens: peanuts, soybeans, milk, eggs, fish, wheat and nuts. This allows knowing what to avoid . (WHEELER , 2019)

1.1.2.Food label sections and their components

1.1.2.1- Serving Information

Serving Size Sample Label

Portion sizes are standardized to facilitate comparison of identical foods, and are presented in well-known units such as cups or pieces, followed by a metric quantity such as the number of grams (g). A serving size describes how much people eat and drink.(FDA , 2020)

Be aware that all amounts of nutrients on the label, including the number of calories, refer to serving size. (FDA , 2020)

1.1.2.2- Calories

Calories Sample Label

Calories provide a measure of how much energy we get from a serving of that food. In order to maintain weight, the number of calories consumed and drunk must be balanced with the number of calories used by the body. The need for calories varies according to age, gender, height, weight, and level of physical activity.(FDA , 2020)

1.1.2.3- Nutrients

Nutrients on Sample Label

Nutrients to get in less quantity: saturated fat, sodium, added sugars, saturated fats, sodium, and added sugars are the nutrients listed on the label that may be associated with adverse health effects.(FDA , 2020)

Added sugars on the Nutrition Facts Label include sugars added during food processing (such as sucrose or dextrose), foods packaged as sweeteners (such as table sugar), sugars from juices, honey, and sugars from concentrated fruit or vegetable juices.(FDA , 2020)

The nutrients that should be obtained in a larger quantity: dietary fiber, vitamin D, iron, potassium, calcium.(FDA , 2020)

1.1.2.4- The Percent Daily Value (%DV)

%Daily Value on the sample label

The daily value (% DV) is the percentage of the daily value of each food item in a serving of food. Daily values are reference amounts of nutrients to be consumed or not exceeded each day.(FDA , 2020)

% DV or less of the nutrients per serving is considered low

% DV or more of the nutrients per serving is considered high

Upper Limit - Eat "Less Than"..... "

Minimum - Take "at least"..... "

Total sugars and trans fats do not have a% Daily Value on the Nutrition Facts label.

1.1.2-Fat

Fatty acids are straight chains of carbon atoms with two hydrogen atoms attached to most of the carbon atoms, but they differ in the length of the chain and in the number of double bonds between the carbon atoms. Fatty acids that do not have double bonds are called saturated fatty acids, and those that have one double bond are monounsaturated fatty acids, which have more than one double bond of polyunsaturated fatty acids.(Fuller & et al , 2016)

The fats stored in adipose tissue provide a long-term backup source of energy, as they produce twice as much energy as protein and carbohydrates.(Fuller & et al , 2016)

1.1.3-Cholesterol

Cholesterol is a sterol compound found in most tissues of the human body. It is used to make hormones and vitamins that dissolve in fats and bile acids. The primary source of cholesterol is from animal foods, such as eggs, dairy products, and cheese.

Cholesterol can be classified based on density as high-density lipoproteins (HDL), low-density lipoproteins (LDL), or very low-density lipoproteins (VLDL). Triglycerides are also part of the blood lipid profile . (Sundjaja& et al, 2020)

1.1.4-Fiber

Dietary fiber is a heterogeneous group of plant food components that resist digestion by enzymes produced by the human digestive system. (Dhingra et al , 2012)

It includes cellulose, non-cellulosic sugars such as hemicellulose, bacterial matter, gums, and a non-carbohydrate component of lignin. (Dhingra et al ,2012)

Fibers are divided on the basis of their physical and chemical properties:

1- Soluble fiber: It is soluble in water and derived from the inner pulp of plants such as pectin, gum and gum. The bacteria in the colon usually ferment them into gases and byproducts such as short chain fatty acids. Sources include: legumes, beans, and vegetables like broccoli, carrots, and barley.(Akbar & et al, 2020)

2- Insoluble fiber: It is derived from the outer shell of plants. It is insoluble in water and does not undergo fermentation by coliform bacteria. Its sources include: cellulose like potatoes and green vegetables, Hemicellulose like whole grains, and lignin like nuts and seeds. (Akbar & et al, 2020)

Dietary fiber has been touted as supportive of laxity, eases blood glucose responses, and helps lower cholesterol. (Fuller & et al , 2016)

1.2.Objectives

1.2.1. Main Objective

The main objective of this study is to determine the awareness of male and female students in reading Food Label at Palestine Polytechnic University.

1.2.2 Specific objectives

1-Determine the relationship between reading food labels, obesity and overweight.

- 2-Determine the relationship between reading Food Label and fruit and vegetable consumption .
- 3-Determine the effect of a Food Label reading and consumption of unsaturated fats triglycerides and cholesterol.
- 4-Finding the relationship between reading food labels with BMI.
- 5-Finding the relationship between reading food labels with gender.
- 6-Finding the relationship between reading food labels with university specialization.
- 7-Finding the relationship between reading food labels with BMI and gender.

1.3.Research Question

What is the level of awareness of university students about the food label and what are the factors that affect their knowledge at Polytechnic University Palestine – Hebron ?

1.4.Research Hypothesis

- 1- The effect of reading food labels on sugar consumption.
- 2- There is a relationship between reading food labels, obesity and weight gain.
- 3- There is a relationship between reading the food label and fiber consumption.
- 4- The effect of reading food labels on consumption of unsaturated fats, triglycerides and cholesterol.
- 5- Differences in knowledge and awareness of reading food labels among university students during their life experiences

2. Literature Review

Our study was about awareness and knowledge of reading the food label among university students. In this section, we will present some studies that measured the percentage of students' awareness of reading the food label in different universities around the world, or that were published in the research review.

1- Ishanka A, et al, a cross-sectional study conducted in 2012 of 542 grade 12 students in Sri Lanka, using a self-survey of socio-demographic values, snack-eating behavior, attitudes, and nutritional knowledge related to food. The posters included 542 students of grade 12 in Sri Lanka. Of the participants, 51% were males; 61% spent their pocket money at least once / week on packaged snacks; predominantly on biscuits (85%) and cola-drinks (77%) and 88% selected snacks on their own. The majority (74.5%) was frequent ('always' or 'most often') label readers with female predominance ($p < 0.05$). Over 74% paid attention frequently to the brand name (75%), price (85%) and nutrition panel (81%). Over 64% were able to select the better food label when given a choice between two snacks, although some did it for reasons such as attractive label (63%). The majority (84%) had good knowledge (obtaining more than the 75th percentile mark) on interpreting labels. Although not statistically significant, 'unsatisfactory' label use was higher among males (73%), purchasing power (70.4%) and unhealthy snacking behavior (73%). In contrast, among the marketing strategies, known brands (73.2%) and imported products (75.8%) as 'good' products were significantly associated with 'unsatisfactory' label use ($p < 0.05$).

2- Wojcicki J & Heymann M, using the National Health and Nutrition Examination Survey from 2005-2006, included 1160 people, average ages: 16-19 years, using a questionnaire, and the result was that most adolescents (92.4%) were familiar with the Nutritional Index pyramid. Less (43.5%) were aware of the 5-A-Day program, and fewer (29.3%) were aware of the Dietary Guidelines for Americans. Less than 25% of teens decide which foods to buy by reading the materials on the Nutrition Facts label. There were significant racial and ethnic differences in awareness of federal nutrition programs as Mexican Americans had the lowest levels of awareness of the American Dietary Guidelines for Americans and the Dietary Guide Pyramid compared to other

groups. Non-Hispanic whites were higher, and African American teens had lower frequencies of reading fat information on the nutrition label compared to Mexican Americans and other Hispanics. Awareness of other nutrition programs or other information on the Nutrition Facts label was not associated with an increase or decrease in the risk of being overweight or obese.

3- Lim H, et al, a cross-sectional survey design, included 300 undergraduate students from a university in Seoul, Korea, using a self-report questionnaire, the results showed that 37.8% of the subjects were users of nutrition labels. Three of the fifteen behavioral beliefs differed significantly using the nutrition label. Nutritional label users more strongly agreed on the benefits of using nutrition labels including "Compare and choose better foods" ($P < 0.001$), and "Choose healthier foods" ($P < 0.05$). The negative belief of "annoying" was stronger in non-users than in users ($P < 0.001$). Three out of the 7 sources (parents, siblings, best friend) were important to use the nutrition label. Twelve of the 15 control beliefs differed significantly using the nutrition label. These included beliefs related to limitations in the use of nutrition labels (eg, spending time and money on healthy foods) and a lack of nutrition knowledge ($P < 0.001$). The observed confidence in the understanding and application of nutrition label specifications in food selection was also significantly associated with the use of nutrition label ($P < 0.001$).

4- Smith SH, et al, a single-stage cluster sampling technique was used, data were obtained using a self-validated and validated questionnaire, and the survey was attended by 553 students in randomly selected classes in the College of Arts and Sciences (modified 92% response), and the sample consisted of roughly equal numbers of males and females. Females, most of whom are between the ages of 18 and 24 years old, a single-stage cluster sampling technique was used to obtain a questionnaire for the study sample, and there were approximately equal numbers of label users and non-users among males, while the number of classification users outnumbered non-users by four To one. Almost among females. The importance of nutritional information on food labels was the only belief that differed significantly between label users and non-users of both genders. For females, there are no other beliefs that differentiate the naming of users from non-users. However, for males,

significant differences were found between label users and non-users regarding beliefs that nutritional information is correct and that there is a relationship between cancer and cancer.

5- S Simmaky , et al , a questionnaire was used to collect information from a random sample of 260 consumers buying prepacked foods in supermarkets and retail stores in the Jaffna region. The data were analyzed using SPSS package to determine the correlations between different socio-demographic factors and the use of nutritional label information, and a random sample of 260 consumers buying packaged foods in the supermarkets and retail stores in the Jaffna region, and the data were analyzed using SPSS, and it was found that 92% of Jaffna consumers are familiar with the information on food labels, 89.5% of respondents considered expiration dates and manufacturing the most important information. Study participants, ingredients list, nutritional information, usage instructions, health warnings, and health claims were 60.3%, 59%, 51.9%, 49.4% and 46.9%, respectively. It was indicated that consumers gave less importance to the country of origin, special nutritional characteristics and portion size (47.7% and 39.3%). % And 35.6%, respectively). Awareness and use of nutritional label information was significantly associated with income level, age, profession, and education level of the respondents.

6- Rangita M, Ph.D., this study examined the relationships between nutritional education, knowledge, behavior, use of nutritional supplements, and label-reading behavior among 537 undergraduate students who were randomly selected using a conceptual form, and data were collected using self-management, volunteerism, and an anonymous mailed questionnaire, the majority of respondents were women and students. Undergraduate and non-smoking. The average age was 236.1 years. There was a higher percentage of undergraduates and women who had previously exposed nutritional education, positive attitude, and greater knowledge of food labels compared to their graduates and male peers.

7- Raspberry k, et al, this study used a cross-sectional design in which volunteers included a fit sample of 1,294 students from a large university in Texas. A 57-item survey tool was used to assess nutrition label knowledge, attitudes, behaviors, and beliefs about the relationships between diet and disease. Open-ended items were included to identify the reasons for frequent / infrequent use of labels, and using a cross-sectional research design, included an appropriate sample. Of the 1,294 students at a large university in Texas sample for this study, students aged 18 years and over were recruited from among the 88 courses in the Physical Education Activity Program for volunteer participation, and demographic analyzes revealed that 52% of the sample were female and 94% of the respondents indicated that their nationality is "American." The possibility of generalizing the results from the sample to university students was increased due to the relative similarities of the sample characteristics of gender and national origin with the characteristics of the university population; The "illegitimate" and graduate students were underrepresented.

8- Sarah Campus, et al, systematic review conducted by searching electronic databases. Relevant articles were examined by two reviewers and included if they met the inclusion criteria, including eight systematic criteria, a total of 120 articles were included in the review, including cross-sectional surveys (Issue 96), experimental designs (Issue 17), Natural Experiences "(Issue 7) and Population-based Longitudinal Surveys (Issue 2), participants were from a wide range of age groups, socio-economic classes, and geographic regions. Inclusion criteria search strategy, among the most prominent sources of nutrition information are Nutrition labels on prepackaged foods. Nutrition labels are seen as a very reliable source of information and many consumers use nutrition labels to guide their choice of food products. Evidence also shows a consistent association between the use of nutrition labels and healthy diets. However, label use varies greatly across subgroups, with less use among children, adolescents, and the elderly who are obese. The research also highlights challenges in terms of consumer understanding and the appropriate use of labeling information .

<i>Study</i>	<i>Study design</i>	<i>Subjects</i>	<i>Study tool</i>	<i>Comparator</i>	<i>Results</i>
Ishanka& et al	A cross-sectional study was conducted in 2012 among 542 Grade 12 students in Sri Lanka	It included 542 Grade 12 students in Sri Lanka , rang ages: 16-17years	A self-administered questionnaire assessed their socio-demography, snacking behaviour, attitudes and nutrition knowledge related to food labels .	Those who are interested in reading Food Label and apply it in their daily life and those who do not care about reading Food Label and do not apply it in their daily life	Of the participants, 51 % were males; 61 % spent their pocket money at least once/week on packaged snacks; predominantly on biscuits (85 %) and cola-drinks (77 %) and 88 % selected snacks on their own. The majority (74.5 %) was frequent ('always' or 'most often') label readers with female predominance ($p < 0.05$). Over 74 % paid attention frequently to the brand name (75 %), price (85 %) and nutrition panel (81 %). Over 64 % were able to select the better food label when given a choice between two snacks, although some did it for reasons such as attractive label (63 %). The majority (84 %) had good knowledge (obtaining more than the 75th percentile mark) on interpreting labels. Although not statistically significant, 'unsatisfactory' label use was higher among males (73 %), purchasing power (70.4 %) and unhealthy snacking behaviour (73 %). In contrast, among the marketing strategies, identifying known brands (73.2 %) and imported products (75.8 %) as 'good' products were significantly associated with 'unsatisfactory' label use ($p < 0.05$)
Wojcicki & et al	Using the National Health and Nutrition Examination Survey from 2005–2006	It included 1160 people, rang ages: 16-19 years	A questionnaire	Between those who read and apply food labels in their daily lives and those who do not. The relationship between nutritional label use and the risk of overweight and obesity in adolescents .	Most adolescents (92.4%) were aware of the Food Guide Pyramid. Fewer (43.5%) were aware of the 5-A-Day Program, and even less (29.3%) were aware of the Dietary Guidelines for Americans. Less than 25% of adolescents decided which foods to purchase by reading material on the nutrition facts label. There were significant racial and ethnic differences in awareness of federal nutrition programs with Mexican-Americans having the lowest levels of awareness of the US Dietary Guidelines for Americans and the Food Guide Pyramid in comparison with other groups. Non-Hispanic whites had higher and African-American adolescents had lower frequencies of reading fat information on the nutrition label in comparison to Mexican-American and other Hispanics. Awareness of other nutrition programs or of other information on the nutrition facts label was not associated with increased or decreased risk for overweight or obesity.
Lim& et al	a cross-sectional survey design .	300 female college students from a university in Seoul, Korea.	the questionnaire by self-report	Those who know how to read and use Food Label and those who do not know how to read Food Label and the factors (beliefs) that influence its reading and application	The results showed that 37.8% of subjects were nutrition label users. Three out of 15 behavioral beliefs differed significantly by nutrition label use. Nutrition label users agreed more strongly on the benefits of using nutrition labels including 'comparing and selecting better foods' ($P < 0.001$), 'selecting healthy foods' ($P < 0.05$). The negative belief of 'annoying' was stronger in non-users than in users ($P < 0.001$). Three out of 7 sources (parents, siblings, best friend) were important in nutrition label use. Twelve out of 15 control beliefs differed significantly by nutrition label use. These included beliefs regarding constraints of using nutrition labels (e.g., time, spending money for healthy foods) and lack of nutrition knowledge ($P < 0.001$). Perceived confidence in understanding and applying the specifics of nutrition labels in food selection was also significantly related to nutrition label use ($P < 0.001$)

Smith& et al	. A single-stage cluster sampling technique was used. Data was obtained using a self-administered, validated questionnaire.	A total of 553 students in randomly selected classes in the College of Arts and Science took part in the survey (92% response rate). The sample consisted of roughly equal numbers of males and females, most between the ages of 18 and 24.	A single-stage, cluster sampling technique was used to obtain the study sample. .questionnaire		There were approximately equal numbers of label users and non-users among males, while label users outnumbered non-users by almost four to one among females. The importance of nutrition information on food labels was the only belief that differed significantly between label users and non-users for both sexes. For females, no other beliefs distinguished label users from non-users. However, for males, significant differences were found between label users and non-users on the beliefs that nutrition information is truthful and that a relationship between bre and cancer exists.
Simmaky& et al	A questionnaire was used to collect information from a random sample of 260 consumers purchasing pre-packaged foods at super markets and retail shops in Jaffna district . The data were analysed using SPSS Package to determine associations between various socio-demographic factors and the use of food label information.	a random sample of 260 consumers purchasing pre-packaged foods at super markets and retail shops in Jaffna district	Structred questionnaire across the Jaffna district. .Data was analyzed using SPSS .		It was found that 92% of the Jaffna consumers are aware of the information provided on the food labels.89.5% of participants considered the dates of expiry and manufacture were the most important information. The percent participants considered , list of Ingredients, nutritional information, instructions for use, health warnings and health claims were 60.3%, 59%, 51.9%, 49.4% and 46.9%respectively. It is noteworthy that the consumers assigned less importance to the country of origin, special food characteristics and serving size (47.7%, 39.3% and 35.6%, respectively). Awareness and use of food label information were significantly associated with level of income, age, occupation and level of education of respondents
MISRA&et al	This study examined the relationships among nutrition education, knowledge, attitude, use of nutritional supplements, and label reading behavior among 537 randomly selected college students using a conceptual model .	randomly selected college students using a conceptual model.	data were gathered using a self-administered, voluntary, and anonymous questionnaire via mail .	.	The majority of the respondents were women, undergraduate students, and nonsmokers. The mean age was 236.1 years. A higher percentage of undergraduate students and women had prior exposure to nutrition education, a positive attitude, and greater knowledge of food labels as compared to their graduate and male peers
Catherine& et al	This study utilized a cross-sectional design	Volunteer participants included a convenience sample of 1,294 students from a large university in Texas. A 57-item survey instrument was used to assess nutrition label knowledge, attitudes, behaviors, and beliefs about diet-disease relationships. Open-ended items were included to capture reasons for frequent/infrequent label use..	Using a cross-sectional research design, a convenience sample of 1,294 students at a large university in Texas comprised the sample for this study. Students aged 18 years and over were recruited from 88 physical education activity program courses for voluntary participation		Demographic analyses revealed 52% of the sample was female and 94% of the sample indicated "American" as their nationality .Generalizability of results from the sample to the university's undergraduate population is increased due to the relative similarities of the sample characteristics for gender and national origin to that of the university population; "nontra- ditional" students and graduate students were underrepresented.

Campos& et al	A systematic review was conducted by searching electronic databases. Relevant articles were screened by two reviewers and included if they met inclusion criteria, including eight methodological criteria. A total of 120 articles were included in the review, including cross-sectional surveys (n 96), exper- mental designs (n 17), ‘natural experiments’ (n 7) and longitudinal population- based surveys (n 2).	Participants were from a wide range of age groups, socio- economic strata and geographical regions.	Inclusion criteria Search strategy		Nutrition labels on pre-packaged foods are among the most prominent sources of nutrition information. Nutrition labels are perceived as a highly credible source of information and many consumers use nutrition labels to guide their selection of food products. Evidence also shows a consistent link between the use of nutrition labels and healthier diets. However, the use of labels varies considerably across subgroups, with lower use among children, adolescents and older adults who are obese. Research also highlights challenges in terms of consumer understanding and appropriate use of labelling information.
Darkwa& et al	This was a descriptive research design study	One hundred and forty-three customers were observed in store from four randomly sampled supermarkets. One hundred of these customers completed a self-administered questionnaire.	Purposive sampling was used to identify Nsukwao.		Sixty-five of the 100 consumers (54 females and 46 males) who consented to respond to the questionnaire looked at or read food labels before selecting a food to purchase. Seventy-five per cent reported reading the food labels prior to selecting food. This study found that nutrition knowledge had a low to average impact on consumers’ food choices. Half of the consumers who reported reading the food labels did not do so regularly. This could have implications on how often such information is used when purchasing food. Also, only 22% of the study respondents answered correctly when asked to explain “26% RDA (recommended dietary allowance) vitamin A per serving” on a food label, even though 45% of the respondents had a tertiary education.
Cowburn& et al	A systematic review undertaken between July 2002 and February 2003	Consumer understanding and use of nutrition labelling: a systematic review	Published research world- wide was identified using electronic and other searches.		One hundred and three papers were identified that reported on consumer understanding or use of nutrition labelling, most originating from North America or northern Europe. Only a few studies (9%) were judged to be of high or medium-high quality. Available evidence suggests that consumers who do look at nutrition labels can understand some of the terms used but are confused by other types of information. Most appear able to retrieve simple information and make simple calculations and comparisons between products using numerical information, but their ability to interpret the nutrition label accurately reduces as the complexity of the task increases.

3.Methodology

3.1. Study design

A cross-sectional design study was conducted at Palestine Polytechnic University - Hebron. This study was included Palestine Polytechnic University students. Data was collected after the approval of Research Ethics - Palestine Polytechnic University, Deanship of Scientific Research. The data collected was; Sociodemographic data, eating habits, a questionnaire .

3.2. Study location

This study was in Palestine Polytechnic University – Hebron.

3.3. Study population

The study population consists of Palestine Polytechnic University students.

3.4. Inclusion criteria

All students at Palestine Polytechnic University.

3.5. Exclusion criteria

- 1- Students suffering from chronic diseases.
- 2- Students who have limited capabilities such as deaf, dumb and blind.

3.6. Study Instruments

All data was collected by a Questionnaire designed through Google Form, and it was distributed randomly to university students from all majors, and it was answered electronically.

3.7. Questionnaire design and layout

The questionnaire was designed using Google Form and was distributed to students by a specialized group at the university, and the answer to it was by Palestine Polytechnic University students only, And through it, the extent of awareness and knowledge of reading Food Label was measured.

The questionnaire consists of three sections : Section A involved the demographic information of the participants, Section B involved information related to eating healthy & daily habits, Section C involved Questions about assessing awareness and knowledge of food labels , " It contains twenty questions through which the person's knowledge and awareness of reading food labels was determined, how this affected his consumption of ingredients, and extent the of his eagerness to eat an appropriate amount of them" .(Skrovan, 2018 , Martinelli, 2018 , WHEELER,2019 , Misra,2007 , Simmaky& alt, 2015 , Smith &alt,1999) .

Section C Contains twenty questions that are taken from previous studies that are valid questionnaire assist knowledge and awareness of reading food labels .

The level of knowledge was assessed into 3 levels: less than 50%: poor knowledge, from 50% to 80%: medium knowledge, and more than 80%: high knowledge.

As for the level of awareness, it was assessed based on the level of attitudes according to the food labels, divided between strongly agree, agree, neutral, disagree and strongly disagree. If the Mean of Awareness is less than 3, it tends to be negative attitude according to the food labels.

* (Misra R.,2007).

3.8. Data Collection

The information was collected through a questionnaire designed using the Google Form program, and it was answered electronically, and It was published on special

groups for university students (بنات البوليتكنك ، جمهورية البوليتكنك , nutrition 2018 , nutrition 2019 , clinical nutrition 2020), and it was sent to some university students, especially on Messenger, in addition to sending it to some Messenger groups for Palestine Polytechnic University students. and the answers was collected and converted to the results required for the study.

3.9. Data Analysis

The results was analyzed by SPSS 22.0 , descriptive data was shown as mean and standard deviation (SD), and categorical data were expressed in the form of frequencies and percentages. The group differences in study variables were examined using the analysis of variance (ANOVA) for continues variables and chi square for categorical variables. All results with P values less than 0.05 were considered significant.

4. Results

4.1. Sample Characteristics (Socio-demographic Data)

The result in this section describes the sample characteristic by ten variables including social characteristic (gender, social status, living place, smoking, and number of family, financial income, working beside university, living in university housing, age, and BMI) and study characteristic (college and academic year).

The result showed that 150 participants participated to respond the questionnaire, The average age for a participants was 20.4 which a rounded between 17 and 29 ,22.7% (n=34) were males, and 77.3% (n=116) were females, most of students are single (83.3%), while 16.7% of them are married, and 64.0% of married student have children. Also, 75.3% of the participants lived in city, 23.3% were from village, and only 1.3% were from the town. About the smoking, 85.3% are not smoker. For a student life, only 3.3% are living in university housing, also the result indicates that the financial income of the most participants between 1000NIS and 2000NIS (60.9%), and 39.1% of them their financial more than 2000 NIS (see table 1).

Additionally, most of participants don't work besides studying at the university (17.3%). Also, 24% of participants are a student in Medicine and health sciences college, 21.3% in engineering college, 18% in Administrative sciences and information system, and 13.3%, 12%, and 11.3% of them are a student in Applied Science, Applied Professions and Computer engineering and information technology respectively. About academic year, 28% of participants are in the second year, 25.3% in the fourth year, while 6% in the fifth year (see table 1).

Table (4.1): Sample characteristic

Variables	Categories	Frequency	Percentage (%)
Gender	Male	34	22.7
	Female	116	77.3
Social status	Single	125	83.3
	Married	25	16.7
Have a children for a married students	Yes	16	64.0
	No	9	36.0
Living place	City	113	75.3
	village	35	23.3
	camp	2	1.3
Working besides studding	Yes	26	17.3
	No	124	82.7
College	Engineering	32	21.3
	Applied Science	20	13.3
	Applied Professions	18	12.0
	Medicine and health sciences	36	24.0
	Computer engineering and information technology	17	11.3
	Administrative sciences and information systems	27	18.0
Academic year	First	33	22.0
	second	42	28.0
	Third	28	18.7
	fourth	38	25.3
	Fifth	9	6.0
Live in university housing	Yes	5	3.3
	No	145	96.7
Smoking status	yes	22	14.7
	No	128	85.3
Financial income	1000NIS -2000 NIS	56	60.9
	2000NIS -3000NIS	18	19.6
	More than 3000 NIS	18	19.6

4.2.Nutrition assessment

Anthropometric Data

the average BMI of participants 22.67 with stander deviation 3.451, also all values between 15.22 and 34.42 .

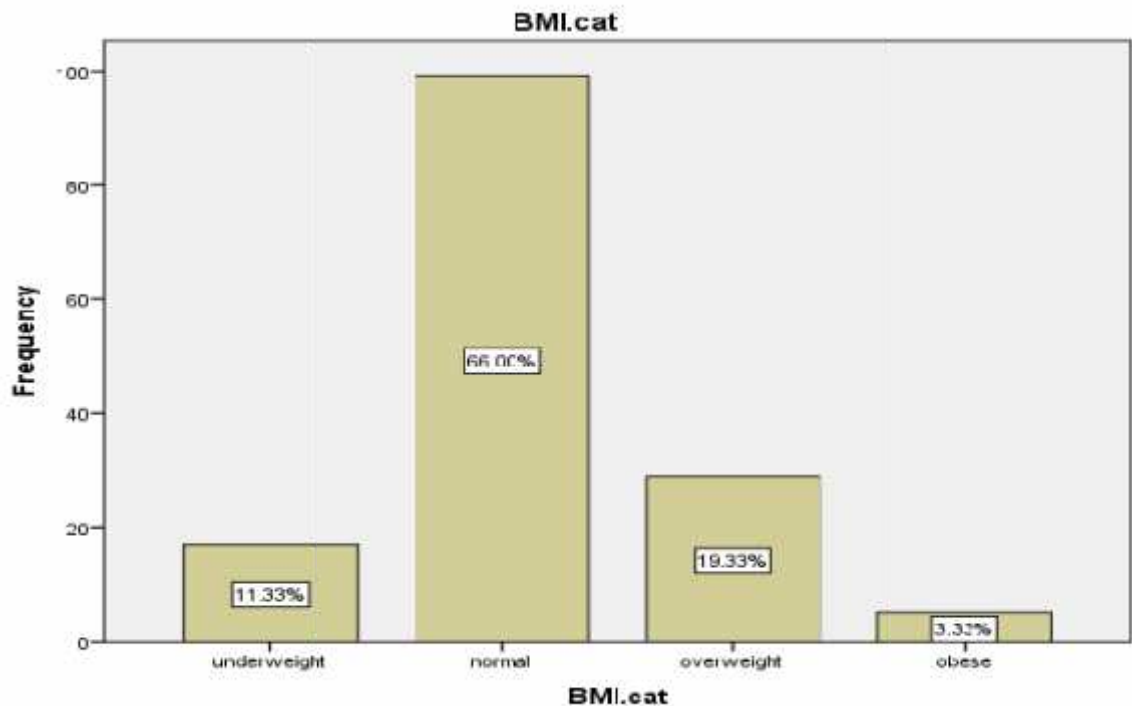
(Table 4.2):Anthropometric Data

Variables	Mean	S.D	Min.	Max.
Height	164.5	8.432	150	187
Weight	61.7533	12.862	37	105
BMI	22.6702	3.451	15.22	34.42

The major of participants were among desirable or healthy range , the percentage of normal BMI was about (66%) , followed by 19.3% of students were among overweight, 11.3% of them were among underweight, And the lowest percentage for obesity , only 3.3% were among obese , it is about 3.3% of all students) as shown in Table 4 (see figure 2).

(Table 4.3): Percentage of categories of BMI:

BMI	Frequency	Percent
Underweight	17	11.3
Normal	99	66.0
Overweight	29	19.3
Obese	5	3.3
Total	150	100.0



(Figure 4.1): Percentage of BMI

Correlation between reading food label and BMI:

There was no significant relationship between the BMI of the students and reading food labels, the result of mean of BMI for student that who are reading food labels is 22.72 , on the other hand the mean of BMI of student that who are not reading food labels is 22.57, and the p value was is 0.303 (p-value greater than 0.05)as shown in Table 3.

(Table 4.4): Correlation between BMI and Reading food label:

Reading food labels	Frequency	BMI Mean	P value
Yes	96	22.72+3.95	0.303
NO	54	22.57+3.20	

Nutrition habits for the participants

In this study, participants were asked about the nutrition habits by thirteen questions. The result clarifies in tables (2) more than half of participants were eating a vegetables and fruit always (52.7%), and 40.6% sometimes, in addition 40.3% of participants were eating them one time in day, 34.2% of them were eating two times, while 25.5% one times, weekly, the most of participants were eating vegetables and fruit four times (69.3%), and 39.7% of them eating less than three time, about the times of eating snacks, 46% of them eating two snacks, 38% of them eating one snack, and only three snacks or more. In other hand, the most of participants were eating one fast food meal in week (32.2%), and 27% of participants were eating three or more meals in week, while 19% of them were eating two meals.

As shown in Table 2, 46% of respondents didn't practice any sport activity, also 32.7% of them only practice a sport one or two time, and only 21.3% of them practice sport three times or more. According the result of sport activities, the most of participants practice a walking (43.8%), 19.2% of them practice running, and 36.9% practice another type of sport. About the time on average at each activity that the respondents do it, the result indicates that 60.2% of respondents takes 30 minutes or less, 24.1% of them takes one hour, 15.6% of them takes one hour or two hours.

Furthermore, participants were asked about the nutrition in showing time of TV or phone, the most of participants spend three hour or more (64.7%), followed by 20% of them spend two hours, and 15.3% of them spend one hour or less. According on

these hours, 40% of participants don't eat anything, 36.7% were eating chocolate and chips, and only 20% were eating fruit and vegetables.

Also, the result indicates that 19.3% of participants takes a nutritional supplements, approximately a half of them take a group of vitamins, 27.6% takes a vitamins C.

Table (4.5):Nutrition assessment

Variables	Categories	Frequency	Percentage (%)
Eat fruit and vegetables	always	79	52.7
	sometimes	61	40.6
	Rarely	10	6.7
How many fruit and vegetables do you eat during the day	One	60	40.3
	Two	51	34.2
	Three	38	25.5
How many fruit and vegetables do you eat during the week	One	4	2.7
	Two	20	13.3
	Three	22	14.7
	Four	104	69.3
How many main meals during the day	one meal	17	11.3
	two meal	83	55.3
	three meals or more	42	28.0
	other than that	8	5.3
How many snacks during the day	one snack	57	38.0
	two snacks	69	46.0
	three snacks or more	24	16.0
How many times a week do you exercise	Once	25	16.7
	Twice	24	16.0
	three or more times	32	21.3
	I don't play sports	69	46.0
What kind of sports	walking	32	43.8
	running	14	19.2
	resistance	4	5.5
	swimming	3	4.1
	football	5	6.8
	Cardio	8	11.0
How long do exercise last	pressure	7	9.6
	Less than 30 minute	25	30.1
	30 minute	25	30.1
	1 hour	20	24.1

	2 hours	6	7.2
	3 hours	7	8.4
How many hours do you spend on TV or phone	Less than one hour	17	11.3
	one hour	6	4.0
	two hours	30	20.0
	three hours or more	97	64.7
What do you eat during these hours	Fruit	27	18.0
	vegetables	3	2.0
	chocolate and chips	55	36.7
	pastries	5	3.3
	None	60	40.0
How many times a week do you eat fast food	one time	48	32.2
	Twice	29	19.5
	three or more times	41	27.5
	other than that	31	20.8
Do you take nutritional supplements	Yes	29	19.3
	No	121	80.7
What kind of nutritional supplement	calcium	1	3.4
	Iron	4	13.8
	B complex	1	3.4
	vit c	8	27.6
	a group of vitamins	15	51.7

Assessment of knowledge and awareness of reading food label

This section of study describes the student awareness and knowledge of nutritional label reading, the result in table (3) clarifies that 64% of participants were reading the nutritional label when select in proper chasing processed food, also 82.6% of participants confirmed the importance of nutritional labels in maintaining health, while 2% confirmed the nutritional labels in not important formaintaining health, in other hands 51.4% of participants read or heard the way to use the food label information. In addition, 61.1% of participants take a prior exposure to nutrition education, and 56% of them read or heard calculate the amount of car Bo hydra test he body needs, also 76% of them interested to having health writ ten on food products.

Table (4.6): Assessment of knowledge and awareness of reading food labels

Variables	Categories	Frequency	Percentage (%)
Nutritional a blare read when select in groper chasing processed food	Yes	96	64.0
	No	54	36.0
How important are nutritional labels in your view of maintaining health	very important	67	45.0
	important	56	37.6
	I do not know	23	15.4
	not important	3	2.0
Have you ever read hear do learned how to use food label information	Yes	76	51.4
	No	72	48.6
Prior exposure to nutrition education	Yes	91	61.1
	No	58	38.9
Calculate the amount f car Bo hydra test he body needs	yes	84	56.0
	No	66	44.0
Are you interested in having health writ ten on food products	yes	114	76.0
	No	36	24.0

To assess the student knowledge, participants were asked about the nutrition by nine questions, table (4) clarifies that 96.6% of participants confirmed to exist a relationship between fat consumption and heart disease, and 94% of them confirmed to exist a relationship between calcium and osteoporosis, 38% of them have a knowledge about proteinases that body need per day, while 32.7% of participants have a knowledge for a mount of fiber does women need daily, in additionally 60.7% of them confirmed the source so trans fat in food is cakes and cookie, fried food and microwave popcorn, furthermore 48% of them confirmed the sources fibers of oatmeal, apples and citrus fruits and nuts, while only 10% have a knowledge of the source of low fat, and 68.7% have a knowledge of the source of calcium.

Table (4.7): Participants knowledge (N=150 participants)

	Answer	Correct (✓) Incorrect (✗)	n	%*	% right Answer	% false Answer	Level of knowledge
1. There is a relationship between fat consumption and heart disease	yes	✓	144	96.6	96.6%	3.4%	High knowledge
	no	✗	5	3.4			
2. There is a relationship between calcium and osteoporosis	yes	✓	141	94.0	94%	6%	High knowledge
	no	✗	9	6.0			
3. How much proteins the body need per day	0.8 g/kg	✓	57	38.0	38%	62%	Poor knowledge
	2 g/kg	✗	61	40.7			
	3 g/kg	✗	16	10.7			
	other than that	✗	16	10.7			
4. How much fiber does women need daily	25 g	✓	49	32.7	32.7%	67.3%	Poor knowledge
	30 g	✗	65	43.3			
	35 g	✗	10	6.7			
	other than that	✗	26	17.3			
5. How much fiber does men need daily	35 g	✓	77	51.3	51.3%	48.7%	Moderate knowledge
	30 g	✗	30	20.0			
	25g	✗	16	10.7			
	other than that	✗	27	18.0			
6. What the source so trans fat in food	All of them	✓	91	60.7	60.7%	39.3%	Moderate knowledge
	fried food	✗	53	35.3			
	microwave popcorn	✗	1	0.7			
	cakes and cookies	✗	5	3.3			
7. Good source of fiber	all of them	✓	72	48.0	48%	52%	Moderate knowledge
	apples and citrus fruits	✗	37	24.7			
	nuts	✗	9	6.0			
	oatmeal	✗	32	21.3			
8. Good source of low fat	lean meats	✓	15	10.0	10%	90%	Poor knowledge
	seafood	✗	33	22.0			
	nuts and seeds	✗	14	9.3			
	eggs	✗	15	10.0			
	all of them	✗	73	48.7			
9. Good source of calcium	all of them	✓	103	68.7	68.7%	31.3%	Moderate knowledge
	green leafy vegetables	✗	3	2.0			
	sardines	✗	2	1.3			
	milk	✗	42	28.0			
Average of total knowledge					55.5%	44.45%	Moderate knowledge

*the percentage represent from the valid number of response

The mean knowledge score (\pm SD) was $48.10 \pm 16.15\%$, and just 48.3% of the participants scored $> 50\%$ (Figure 4.2).

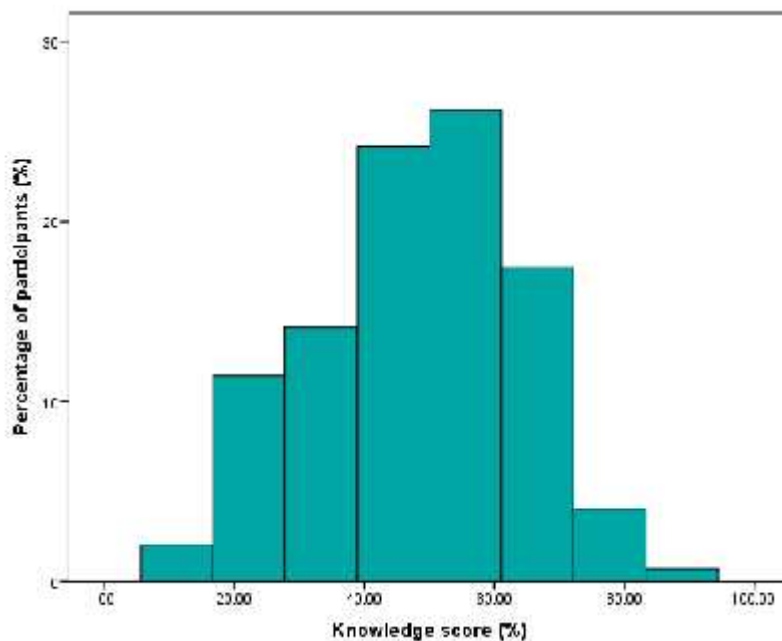


Figure 4.2: Overall knowledge scores of participants (n = 149, one participant did not respond)

The result in table (5) showed that the mean response of the choosing healthy foods and not eating foods high in fat or sodium prevent obesity is 3.29, also 46% (n=69) of the participants were agree for that and 26% (n=39) were disagree. Furthermore, the mean response of the nutritional label helps to eat an adequate amount of foods and compare foods in choosing a food is 3.50 as 52.6% (n=79) were agree and 10% (n=15) were disagree. Also, the mean response of there is credibility in food labels is 3.25 as 38% (n=57) were agree and 13.3% (n=20) were disagree.

The lowest mean was for Food label helps you eat an adequate amount of foods, and compare foods in choosing a food (mean=2.81) as 19.3% (n=29) of participants were agree and 32.7% (n=49) were disagree.

Table (4.8): Awareness

	Strongly agree *	Agree*	Neutral*	Disagree*	Strongly disagree*	Mean	S.D	Level of awareness
choosing healthy foods and not eating foods high in fat or sodium prevent obesity	12.7 (19)	33.3 (50)	28 (42)	22 (33)	4.0 (6)	3.29	1.07	Positive attitude
the nutritional label help to eat an adequate amount of foods and compare foods in choosing a food	9.3 (14)	43.3 (65)	37.3 (56)	8.0 (12)	2.0 (3)	3.5	0.85	Positive attitude
Food labels not to eat favorite foods and spend time choosing food	3.3 (5)	16 (24)	48 (72)	24 (36)	8.7 (13)	2.81	0.92	Negative attitude
There is credibility in food labels	2 (3)	36 (54)	48.7 (73)	12 (18)	1.3 (2)	3.25	0.74	Positive attitude
Average of total Awareness						3.21	0.89	Positive attitude

Note: * represent cells represent by percentage (frequency)

There was a significant difference between the students who were reading food label according to the gender. As compare the females who were reading food label is 70.7% of the all females , and only 41.4% of all males who were reading food labels , and the p value = 0.002 (p value is less than 0.05) as shown in Table (9).

Table (4.9): Correlation between Gender and Reading food label Using Chi square test :

	Yes		No		P value
	N	%	N	%	
Male	14	41.2	20	58.8	0.002
Females	82	70.7	34	29.3	

There was a significant difference between the students who were reading food label according to their collage (p value less than 0.05) The highest percentage of college that whose students were reading food labels was among medicine and health sciences students more than other collages students , approximately 94% of students in this collage were reading food labels, then ,the second students that were reading food labels was in collage of Applied professions, about 61% of their students were reading food labels, and also College of Engineering about 69%, And after that, the results were similar in other colleges such as: College of Computer Engineering and Information technology , They were confined to between 48%-59% of the college students were reading food labels.

Table (4.10): Correlation between Collage and Reading food label Using Chi square test :

	Yes		No		P value
	N	%	N	%	
Engineer	19	59.4	13	40.6	.001
Applied Sciences	10	50.0	10	50.0	
Applied professions	11	61.1	7	38.9	
Medicine and health sciences	34	94.4	2	5.6	
computer engineering and information technology	9	52.9	8	47.1	
administrative sciences and information systems	13	48.1	14	51.9	

There was no significant difference between healthy eating habits of students (Eating Fruits and vegetables, Number of main meal, Number of snacks, Doing exercises during the week, Eating fast food per week and Taking nutritional supplements) according to reading food labels (p value more than 0.05) , and this table (11) shows the correlations between each eating habits and the reading food labels among the students.

Table (4.11): Correlations between healthy eating habits and reading food label:

Eating Habits		Yes		No		P value
		N	%	N	%	
Eating Fruits and vegetables	Always	58	73.4	21	26.6	0.39
	Sometimes	33	54.1	28	45.9	
	Rarely	5	50.0	5	50.0	

Number of main meal	One	12	70.6	5	29.4	0.94
	Two	52	62.7	31	37.3	
	Three or more	27	64.3	15	35.7	
Number of snacks	One	37	64.9	20	35.1	0.98
	Two	44	63.8	25	36.2	
	Three or more	15	62.5	9	37.5	
Doing exercises during the week	Once	15	60.0	10	40.0	0.16
	Twice	17	70.8	7	29.2	
	Three or more	25	78.1	7	21.9	
	Never	39	56.5	30	43.5	
Types of foods chosen during rest time	Fruits	20	74.1	7	25.9	0.38
	Vegetables	3	100	0	0.0	
	Chocolate and chips	33	60.0	22	40.0	
	Pastries	4	80.0	1	20.0	
	None	36	64.0	54	36.0	
Eating fast food per week	Once	32	66.7	16	33.3	0.20
	Twice	18	62.1	11	37.9	
	Three on more	22	53.7	19	46.3	
	None	24	77.4	7	22.6	
Taking nutritional supplements	Yes	20	69.0	9	31.0	0.34
	No	76	63.3	44	36.7	

There was no significant difference between the attitudes of the students (choosing healthy foods and not eating foods high in fat or sodium prevent obesity ,the nutritional label help to eat an adequate amount of foods and compare foods in choosing a food, Food label helps you eat an adequate amount of foods, and compare foods in choosing a foodand There is credibilityin food labels) according to the food labels with the BMI as Shawn in table (12) .

Table (4.12):Correlation between the attitudes of the students according to the food labels with the BMI :

		N	Mean + SD	P value
choosing healthy foods and not eating foods high in fat or sodium prevent obesity	Underweight	17	3.47+1.18	0.36
	Normal	99	3.18+1.04	
	Overweight	29	3.44+1.09	
	Obese	5	3.8+1.10	
the nutritional label help to eat an adequate amount of foods and compare foods in choosing a food.	Underweight	17	3.65+0.60	0.88
	Normal	99	3.47+0.90	
	Overweight	29	3.51+0.83	
	Obese	5	3.40+0.54	
Food labels not to eat favorite foods and spend time choosing food	Underweight	17	2.52+1.00	0.46
	Normal	99	2.82+0.94	
	Overweight	29	2.86+0.87	
	Obese	5	3.20+0.45	
There is credibilityin food labels	Underweight	17	3.35+0.60	0.88
	Normal	99	3.26+0.76	
	Overweight	29	3.17+0.14	
	Obese	5	3.20+0.75	

There was no significant difference between the attitudes of the students according to the food labels to their gender (p value > 0.05).

Table (4.13): Correlation between attitudes of the students according to the food labels and their gender:

		N	Mean + SD	P value
choosing healthy foods and not eating foods high in fat or sodium prevent obesity	Male	34	3.41±0.89	0.093
	Female	116	3.25±1.11	
the nutritional label help to eat an adequate amount of foods and compare foods in choosing a food.	Male	34	3.11±0.84	0.47
	Female	116	3.61±0.82	
Food labels not to eat favorite foods and spend time choosing food	Male	34	2.82±0.9	0.95
	Female	116	2.81±0.93	
There is credibility in food labels	Male	34	3.23±0.78	0.90
	Female	116	3.25±0.73	

There was no significant difference between the attitudes of the students according to the food labels to their collage (p value >0.05).

Table (4.14):Correlation between attitudes of the students according to the food labels and their collage:

		N	Mean + SD	P value
choosing healthy foods and not eating foods high in fat or sodium prevent obesity	Engineering	32	3.28±1.14	0.086
	Applied Sciences	20	3.10±1.33	
	Applied professions	18	3.5±0.86	
	Medicine and health Sciences	36	3.61±1.02	
	Computer Engineering	17	3.05±0.97	
	Administrative	27	3.00±0.96	
the nutritional label help to eat an adequate amount of foods and compare foods in choosing a food.	Engineering	32	3.56±0.76	0.73
	Applied Sciences	20	3.40±0.68	
	Applied professions	18	3.33±0.84	
	Medicine and health Sciences	36	3.86±0.83	
	Computer Engineering	17	3.35±0.86	
	Administrative	27	3.22±0.97	
Food labels not to eat favorite foods and spend time choosing food	Engineering	32	3.87±0.90	0.24
	Applied Sciences	20	3.05±0.89	
	Applied professions	18	2.88±1.13	
	Medicine and health Sciences	36	2.44±0.90	
	Computer Engineering	17	3.17±0.72	
	Administrative	27	2.77±0.84	
There is credibility In food label	Engineering	32	3.34±0.70	0.18
	Applied Sciences	20	3.30±0.47	
	Applied professions	18	3.33±0.59	
	Medicine and health Sciences	36	3.14±0.76	
	Computer Engineering	17	3.05±0.90	
	Administrative	27	3.33±0.92	

5. Discussion

Our study was about awareness and knowledge of reading food labels among university students. In this section, we will present some studies that measured students' awareness of reading food labels in different universities around the world, or that were published in the research review, and we took the results of these studies and compared them with the results of our study.

In the study conducted at the University of Waterloo in Canada, the proportion of people who read food labels was 52%, and those who did not read 48%. In our study, the proportion of people who read food labels was 64.6% and the proportion of people who did not read food labels was 35.4%. Here, the proportions were similar in the two studies.

***(campos s & et al,2010)**

In the study conducted at the University of Saskatchewan in Canada, the percentage of females who read Food Label was 78.8% of all females, and the percentage of males who read Food Label was 48.6% of all males, as compared to our study that was conducted at Palestine Polytechnic University, the result was females who were reading food label is 70.7% of the all females, and only 41.4% of all males who were reading food labels ,and This means that the results for both females and males are close in the percentage of studies at the two universities, and this confirms the existence of a relationship between gender and reading the food labels.

***(Smith S & et al,1999).**

In the study conducted at the University of Waterloo in Canada, women reported reading food labels significantly more than men in the majority of studies that included both sexes, and women were also more likely to report the impact of food labels on their food choices and confidence in food labels. In our study, the percentage of females who read food labels was more than males, and this means that the results were similar in the two studies.

***(Smith S & et al,1999).**

In the study that was conducted at two Midwestern universities (Ohio University and Truman State University),The percentage of students who never read, heard, or learned information about how to use food labels was more than the percentage of those who read or learned about how to use food labels, which is 55%. More than the percentage of those who did not read, hear or learn information about how to use food labels is 51.4%, so the result is very close between the two studies.

*** (Misra R.,2007).**

In the study that was conducted at two Midwestern universities (Ohio University and Truman State University). The percentage of students who showed great importance to food for labels was 90%, while in our study their rate was 45%.So our percentage was low compared to the percentage of those interested in reading food label.

*** (Misra R.,2007).**

In the study that was conducted at two Midwestern universities (Ohio University and Truman State University). Students did not trust the reliability of the information on food labels, but in our study there was confidence in the reliability of the information on food labels.

*** (Misra R.,2007).**

In the study that was conducted at two Midwestern universities (Ohio University and Truman State University). Cost had a major role in choosing and buying healthy foods, but in our study, cost had no role in choosing and buying healthy foods.

*** (Misra R.,2007).**

In the study conducted at Seoul University in Korea, students who use food labels, with a rate of 85.6%, indicated that food labels affect their choice of foods, and in our study, the use of food labels affects the choice of food for the majority of students. So the result is very close between the two studies.

***(Lim& et al,2015)**

In the study that was conducted at Seoul University in Korea, there was no difference in BMI between students who read food labels and those who did not read food labels, and in our study there was no statistically significant relationship between students' BMI and reading food labels. So the result is very close between the two studies.

***(Lim& et al,2015)**

In the study conducted at the University of Waterloo in Canada, many consumers reported that nutrition labels are an important source, as a final result of attitudes positive attitudes according to reading food labels were higher among individuals who reported increased use of food labels, while in our study the majority of positive attitudes were when Most of the students, the end result was positive attitude.

***(campos s & et al,2010)**

In the study conducted at the University of Waterloo in Canada, individuals with healthy eating habits reported reading food labels more, possibly as a result of personal preference due to dietary requirements, among health behaviors not directly related to nutrition, use of nutritional supplements, regular exercise, and lack of Smoking has been associated with the use of food labels, but in our study there was no statistically significant difference between the students' healthy eating habits according to reading food labels. There were differences between the study that was conducted in Canada and in our study where reading food labels had an effect on their health habits, but in our study there was no effect.

***(campos s & et al,2010)**

Limitations :

One of the most important difficulties we faced was that it was the last event in the world, which was Covid 19 “Corona”, which led to side effects, including: the inability to deal and communicate with students face to face, especially since dealing with a stranger electronically is more difficult, so we cannot convince students and encourage them to Fill out the questionnaire adequately electronically, as when we meet them face to face and encourage them to participate and thus not to take information and visual gestures, and not only that, but the credibility of electronic data collection is low. Moreover, the time constraints in both data collection and analysis, in addition to wasting time beyond our control due to the electronic collection of 150 samples. We had great difficulty downloading the spss statistical analysis program due to technical problems in the laptop.

Recommendation

1. We recommend that there be workshops and lectures at the university to teach students how to read food labels.
2. Making brochures and raising awareness among students about food labels, and teaching them how to calculate the amount of calories, carbohydrates, protein and fats that help them choose healthy food and choose a healthy diet for them.
3. Creating banners inside the university in cafeterias and restaurants aimed at educating students about reading food labels and knowing how to read food labels
4. An electronic application can be downloaded on smart phones that helps in calculating calories and the amount of proteins, carbohydrates and fats needed for each person by entering the person's demographic data

6. Conclusion

According to study of the level of awareness and knowledge of reading food labels , it was acceptable, especially for their knowledge of nutritional information related to food labels and for their behavior towards reading food labels, it is considered good to moderate, but there was no direct relationship linking these behaviors with private information. With students, though, this level can be improved much further by trying to spread awareness of reading food labels in PPU.

7. References

- 1- Dr. Martini D. (31 July 2020)." Food Labeling: Analysis, Understanding, and Perception". MDPI(Nutrients (ISSN 2072-6643))
- 2- FOOD & DRUG administration (FDA) ." How to Understand and Use the Nutrition Facts Label". (2020/ 11/ 24).
- 3- Wojcicki J & Heyman M. (2012)." Adolescent nutritional awareness and use of food labels: Results from the national nutrition health and examination survey". BMC Pediatrics .
- 4- Talagala SH &Arambepola C. (2016). "Use of food labels by adolescents to make healthier choices on snacks: a crosssectional study from Sri Lanka". BMC Public Health .
- 5- Lim H& Kim M and Kim K. (2015). "Factors associated with nutrition label use among female college students applying the theory of planned behavior". Nutrition Research and Practice .
- 6- Sundjaja J& Pandey SH.(2020). " Cholesterol Screening". NSBI .
- 7- Dhingra D & Michael M &Rajput H & Patil R .(2012). " Dietary fibre in foods: a review". PUBMED.
- 8- Akbar A &Shreenath A .(2020)." High Fiber Diet". NSBI .
- 9-Fuller S & Beck E & Salman H & Tapsell L .(2016). " New Horizons for the Study of Dietary Fiber and Health: A Review". PUBMED .
- 10-Skrovan S.(2018)." The origins and evolution of Nutrition Facts labeling". FOOD DIVE.

11-Martinelli K. (2018)."Why is Food Labelling Important??.HIGH SPEED TRAINING.

12-WHEELER M. (2019)." Six reasons why food labelling is important". FOODMAG.

13- Misra R.(2007)."Knowledge,Attitudes,andLabel Use among College Students". Google Schooler.

14- Simmaky S and Madhujith T and VasantharubaS.(2015)."Assessment of Consumer Awareness on Food Labels and the Effect of the level of Awareness on Buying Behaviour of Consumers in Jaffna District". Google Schooler.

15- Smith S and Taylor J and Stephen A. (1999)."Use of food labels and beliefs about diet-disease relationships among university students". Pubmed.

16-Cowburn G and StockelyL. (2004)."Consumer understanding and use of nutrition labelling".Pubmed.

17- Darkwa S. (2014)." Knowledge of nutrition facts on food labels and their impact on food choices on consumers in Koforidua, Ghana: A case study".Google Schooler.

Knowledge and awareness of Palestine Polytechnic University students in reading food labels.

Dear Palestine Polytechnic University students : Please help us by answering the following questions with all transparency and credibility. Your opinions and answers are important in our research. Your participation in the questionnaire is voluntary and the information will be confidential and our need for this information for the purpose of scientific research. Thank you so much.

Research team :

YamamaHroub

Ameera Al-Herbawi

Mona Hashalmon

MaramDawoud

Supervisor :

Ms. Israa Sharif

Section1: The demographic information of the participants.

Multiple Choice & Short Answers

1- Age *

2- Gender *

- Male
- Female

3- Social status *

- Bachelor
- Married
- Widower
- Absolute

If he is married, do you have children ?

- Yes
- No

4- Place of living ? *

- City
- Village
- Camp

5- The number of the whole family ? *

6- Do you work besides studying at the university ? *

- Yes
- No

(If your answer is yes to the previous question) What is the nature of your work?

7- The college ? *

8- University Specialization ?

9- Academic year ? *

- First Year
- Second Year
- Third Year
- Fourth Year
- Fifth Year

10- Do you live in university housing ? *

- Yes
- No

11- Do you smoke ? *

- Yes
- No

12- How much is your financial income ?

- 1000 - 2000
- 2000 - 3000
- 3000 or above

Section 2: Healthy eating and daily habits

Multiple Choice & Short Answers

1- The Height *

2- The Weight

3- Do you eat fruits and vegetables ? *

- Always
- Sometimes
- Rarely

4- If you eat, how many fruits and vegetables do you eat during the day ?

- One piece
- Two piece
- Three piece

5- If you eat, how many fruits and vegetables do you eat during the week?

- One piece
- Two piece
- Three piece
- Four or above

6- How many main meals during the day ? *

- Meal
- Two meals
- Three meals or more
- Other than that

7- How many snacks during the day ? *

- One snacks
- Two snacks
- Three snacks or more

8- How many times a week do you exercise ? *

- Once
- Twice
- Three or more times
- I don't play sports

(If you do sport) what kind ?

9- How long does exercise last ?

- 30 minute
- 1 Hour
- 2 Hours
- 3 Hours

10- How many hours do you spend on TV / phone ? *

- One hour
- Two hours
- Three hours or more

11- What do you eat during these hours ? *

- Fruits
- Vegetables
- Chocolate and chips
- Pastries
- None

12- How many times a week do you eat fast food ? *

- One time
- Twice
- Three or more times
- Other than that

13- Do you take nutritional supplements ? *

- Yes
- No

(If you take nutritional supplements) What kind ?

Section 3: Questions about assessing awareness and knowledge of food labels.

Multiple Choice

- 1- Nutrition labels are read when selecting or purchasing processed foods or snacks ? *
 - Yes
 - No

- 2- How important is food labels in your view of maintaining health?

- 3- Have you ever read, heard, or learned how to use food label information ? *
 - Yes
 - No

- 4- Prior exposure to nutrition education ? *
 - Yes
 - No

- 5- Have you ever read, heard, or learned how to calculate the amount of carbohydrates the body needs ? *
 - Yes
 - No

- 6- Are you interested in the presence of health "claims" guidelines written on food products (for example: this milk contains vitamin D important for the prevention of osteoporosis)?
 - Yes
 - No

- 7- There is a relationship between fat consumption and heart disease ? *
 - Yes
 - No

- 8- There is a relationship between calcium and osteoporosis ? *
 - Yes
 - No

- 9- How much protein does the body need per day ? *
 - 0.8 g / kg of body weight

- 2g / kg of body weight
- 3 g / kg of body weight
- Other than that

10- How much fiber does women need daily ?

- 25 g
- 30 g
- 35 g
- Other than that

11- How much fiber do men need daily ?

- 25 g
- 30 g
- 35 g
- Other than that

12- What the sources of trans fat in food ? *

- Cakes & Cookies
- Fried foods
- Microwave popcorn
- All of them

13- Good source of fiber ? *

- Oatmeal
- Apples & citrus fruits
- Nuts
- All of them

14- The Good Source of Low Fat ? *

- Lean meats
- Seafood
- Nuts & Seeds
- Eggs
- All of them

15- The good source of calcium ? *

- Milk
- Cheese
- Green leafy Vegetables
- Sardines
- All of them

16- Choosing healthy foods and not eating foods rich in fat or sodium prevents obesity ? *

- Strongly Disagree
- Disagree
- Neutral
- Agree

- Strongly Agree

17- The food label helps you eat an adequate amount of foods, and compare foods in choosing a food ? *

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

18- Food labels not to eat favorite foods and spend time choosing food ? *

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

19- There is credibility in the nutrition dashboard ? *

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree