

# Evaluation of the Effect of Knowledge Concerning Healthy Nutrition and Nutrition Science on the Knowledge Development Approach

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## Abstract

**Background:** Nutrition can be regarded as an important part of any preparation program, as well as an important part of life. It seems essential to develop nutritional science and improve eating habits with the purpose of developing a healthy diet and avoiding the outcomes that arise from a lack of nutrition. Proper nutrition is one of the important factors for the development of health. Lack of sufficient awareness about nutrition can result in improper eating habits.

**Objectives:** The present study evaluated the effect of knowledge about healthy nutrition and nutrition science on the knowledge development approach.

**Materials and Methods:** In this cross-sectional descriptive study, the statistical population consisted of 190 experts and other scholars in the area of nutritional science. A questionnaire based on demographic details, nutritional science, nutrition education, research, proper solutions to individuals' nutritional problems, and a culture of nutrition was used for data collection.

**Results:** A relatively strong positive correlation was found between the knowledge development approach, nutritional science, nutrition education and research, and proper solutions for individual nutritional problems and a culture of nutrition ( $P < 0.001$ ).

**Conclusions:** 1) Effective enhancement and participation in an academic community will be important in the future of food and nutrition security; however, major gaps and weaknesses also exist in this context; 2) The main weaknesses in relation to the lack of clear policies and procedures include focusing on only Tehran, Iran; the need to overcome bureaucracy; and problems related to motivation, capital, and international communications; 3) Qualitative and quantitative improvement of research is not possible without access to skilled experts and researchers; 4) To solve these problems, it will be beneficial to pay more attention to the role of universities, facilitate intellectual communication among professors in Tehran and other provinces, ensure that Iranian professors are employed abroad, develop educational and research cooperation with foreign countries, and ensure that facilities for international cooperation put in place by united nations (UN) agencies are used.

**Keywords:** Nutritional Science, Knowledge Management, Food

## 1. Background

Every human being needs food; as an inherent and physiological need, it is the most critical factor in human survival (1). Food is a constant need, causing humans to attempt to obtain food. However, correct, balanced nutrition is necessary for growth, health, and a long lifespan; it will also enhance the nervous system, thereby facilitating mental and psychological development. Human food must contain proteins, fats, carbohydrates, mineral substances, vitamins, and water to keep the body healthy and make it grow (2). These substances are absorbed in the gastrointestinal tract and used by the body to satisfy vital needs (3).

Food is defined as a solid or liquid substance that produces energy, repairs tissues, makes the body grow, and

adjusts vital activities after it is eaten and digested. All living creatures, such as animals, plants, and microorganisms, need food to survive (4). Meanwhile, many body cells die every day and need to be replaced by new cells that obtain their required substances from food. In addition, sufficient food intake is necessary to fight invading microorganisms and other pathogens, maintain body temperature within a normal range, ensure daily hair and nail growth, and maintain the heart and respiratory system function, body movements, strength for work and activity, and even mental processes (5).

People usually consume a combination of various materials. Carbohydrates and fat sources are energy producers for the body and provide the energy for daily activities.

Proteins are necessary to maintain and recover tissues and create new ones. Vitamins, mineral substances, and water do not contain calories; thus, they do not produce energy. They are required for the natural growth of the body; insufficient vitamin intake may lead to failure in growth, blood complications, lack of bone stability, and many other disorders (4, 6, 7).

Today, food plays a strategic and fundamental role in the world (8). Many countries have completely lost their honor and reputation against the demands of colonizer superpowers, only due to shortage of food sources (8). To have a profitable food production industry and become self-sufficient, authorities should pay serious attention to nutrition science fields. Eating all kinds of food only to fill stomach, if not actually harmful, has no beneficial effects. In definitions of relevant nutrition science fields, they have been identified as fields of science that both qualitatively and quantitatively determine body requirements and guide individuals on how to live a healthy life. Therefore, the importance of proper nutrition is clear (1).

Considering any social or economic issues related to nutrition deficiency in developing countries will automatically relate to the topic of “development” (9). For these countries, development is at the center of their economic objectives. Generally, “development” can be described according to two concepts:

- a) It is used in relation to the “course of development” if a specific transition over time is suggested; and
- b) If a particular point in time is considered, it is used in to denote the “level of development level.”

These two variables are separated by the “time” index. The course of development is “dynamic,” and represents the outcome of a union of various diverse, repetitive “static” situations (10).

The development level indicates the standard at which people in a given society live. Therefore, the “level of development” demonstrates the index or capacity that is the evaluation criterion with regard to the society’s chosen objectives (11). If the development level is considered as an index to evaluate the standard of living, all of the elements in social life that are necessary to determine the standard of living should be included. In this case, the level of development of any society will be defined as the capacity to access a particular criterion for the standard of living (12, 13). Although the knowledge level, public awareness of food materials, and nutrition patterns have been highly promoted, knowledge does not necessarily result in appropriate action, and there are many people who consume harmful food materials with absolute awareness of their effects (14). Healthy food, and in better words, healthy nutrition is one of the most significant and possibly the most fundamental elements of enjoying bodily health (15). Moreover, it also assists in maintaining psychological health (16, 17). Nutrition experts constantly advise individuals to follow a healthy diet to satisfy their bodily needs and prevent illness to the furthest extent possible (18, 19). Nutrition is a determining factor of indi-

viduals’ health or lack thereof. The main goal of nutrition is to take in the six nutritive food groups; these materials will satisfy all bodily needs, thereby helping to maintain healthy organs (20).

Nutritive food helps people to preserve their psychological and physical health. Conversely, excess consuming of any one type of food materials will lead to some type of disease (21). For instance, over-consuming meat causes cancer, while insufficient consumption of cereals which contain the vitamin B group results in psychological complications, such as aggression, dementia, etc. (22-25). Thus, it is clear that nutrition affects all aspects of individuals’ lives. At the same time, exercise is another relevant factor. Nutrition makes the body store food materials and delivers the required fuel to the body. Exercise helps to burn that fuel. Thus, exercise has a direct relationship with nutrition and causes the body to burn useless materials (stored fats); this leads to bodily health, because the lower the amount of body fat a person has, the less likely he or she will to develop cardiovascular diseases (26, 27).

Nutrition is one of the chief components in health improvement and preventing disease (28). Recently, it has been revealed that diseases like cardiovascular diseases, high blood pressure, diabetes, cancer, heart attack, obesity, and osteoporosis, which are responsible for most deaths in many countries, are related to food diet and nutrition (28). The evidence shows that the incidence of these diseases is increasing rapidly worldwide. Currently, many developed countries are tackling the obesity issue, which is referred to as a “silent epidemic.” In contrast, the shortage of food sources and neglect of nutrition quality have caused numerous problems for these countries (29).

### 1.1. What is Nutrition Science?

Studies on mice have revealed that cutting down their food doses will help to increase their longevity. Mice with a moderate diet survive 10% longer than those that receive excess food. Moreover, mice with a moderate diet live longer than those with restricted diets. These mice had smaller bodies, kidneys, spleens, and prostates, as well as a shorter body length. However, their skulls, brains, and genital organs were normal. In this report, it was mentioned that most human beings continue to eat even when they are satiated, which can be hazardous to their health (30). Balancing the input of food can lead to a long lifespan. In contrast, it should be noted that if the food dose provided is less than 10% of what the body needs, this may lead to loss of food sources in the long term, and finally result in a shorter lifespan. The intake of food materials that leads to a drastic, rapid increase in the serum glucose level should be reduced; this represents the best approach to decreasing the appetite and preventing excessive eating (31). Such foods include bread, cookie, and chocolate products, as well as foods which contain added sugar (32). Consuming more than two portions of salad per day can help to avoid this problem. A pure diet

is known to be dangerous. For more than 50 years, Texas health center insisted that a pure food diet was the best method of promoting health and preventing diseases. It had been found that undigested foods in the large intestine change into toxic substances that could reduce the life span and cause cancer. Thus, patients were advised to follow zero food diets to get rid of these unpleasant materials and take a break from digestion activities (33).

Nutrition with a scientific basis that meets of all the body's requirements will secure human health and maximize the body's defense system. Otherwise, the adverse effects of a poor diet are reflected in the organs, leading to a loss of physical and even mental power. In fact, many scientists think that a balanced diet not only increases freshness and vital force but also leads to a long lifespan. Meanwhile, deprivation of food sources will stifle the individual's health and even affect future generations (34, 35).

### 1.2. Reasons for Malnutrition

Deprivation of food sources has been a constant issue in most if not all time periods. This does not necessarily mean "not eating food" or "eating less than required." The food may be of sufficient portion and even fill the intestine, but it is still not efficient for the body. The diet can be imbalanced, which means that some food sources may be delivered to the body sufficiently, while others are present in restricted portions. An imbalanced diet can occur for many reasons, including the following:

- Sometimes, traditions in a given society cause a significant decrease in food; and
- Personal factors have a large influence on malnutrition. Moreover, obvious or hidden complications in the body structure and internal problems may lead to malnutrition.

The shortage or loss of required food, if it occurs, will have different effects. For example, the groups of vitamins which are fundamental requirements of body health and made by living creatures in nature have no similarity to each other; thus, each of them must be consumed sufficiently.

### 1.3. The Importance of Having a Healthy Diet

As a first step, the daily dose of consumed food should provide the required power for various body activities. For instance, about 15,000 calories is the minimum intake needed to support the heart and brain function in the human body. Obviously, although this is the required intake, it is insufficient, because the muscular power required for daily chores, exposure to heat and cold, growth, and many other activities require much more energy than the primary, basic amount.

### 1.4. The Relation Between Knowledge and Nutrition Culture

One of the most remarkable factors in shaping the food

pattern of a society is the nutrition knowledge and culture of its individuals. These praxes arise from childbirth within the family, which is itself dependent on the background provided by society. However, the factors that make up this background are derived from the culture, rituals, and traditions of each society, which are affected by the geographical, cultural, social, and economic contexts, as well as nutrition awareness among the people in that society.

Obviously, malnutrition is significantly influenced by cultural factors, whether it is caused by a shortage of food or welfare (polyphagia, improper eating and their side effects). The consumption problem in Iran is not limited to the low-income class; Iranian families with high incomes are also unable to select the appropriate food materials to secure their health, and their choices sometimes turn out to be troublesome.

Previous studies have revealed that families do not make the best use of limited nutritive food sources that are available inside the house. Thus, we can perceive that economic welfare for accessing food sources does not necessarily secure the optimum use of available sources in the family; rather, the key point is adopting the method and culture of eating for bodily health. In addition, the utmost priority is ensuring the health of children, adolescents, and women, which are considered at-risk groups (36).

### 1.5. Food and Nutrition Education

The main expected roles a society can play in food and nutrition security can be categorized into four groups, as follows:

- Customizing exterritorial science and producing proper technology;
- Functionalizing science to solve society's problems (planning and management);
- Providing support and advocacy to unveil the hidden problems and make attitudes, priorities and policies effective; and
- Educating first-rate scientists to pioneer the science production and function process in national development.

## 2. Objectives

The present study evaluated the effect of knowledge about healthy nutrition and nutrition science on the knowledge development approach.

## 3. Materials and Methods

The literature data for this research were collected through the library research method, while the analytic data were gathered through the field research method. To complete this research, 190 experts in nutrition science were included as participants. Afterwards, the data were processed and statistically analyzed using SPSS soft-

ware. Below, we present the hypotheses and statistical tests which were used in this research.

### 3.1. Data Collection

A questionnaire was used for the collection of data, with questions on demographic characteristics, nutritional science, nutrition education, research, and proper solutions to people's nutritional problems and culture of nutrition. Demographic details included age, educational level, marital status, and work experience. The whole questionnaire took about 30 minutes to complete.

We created a questionnaire to measure nutritional science, nutrition education, research, proper solutions to people's nutritional problems, and culture of nutrition. The validity of contents was evaluated by a panel of 10 experts. It is also notable that some of the items were improved based on the qualitative suggestions of the panel of experts. The Cronbach's alpha was greater than 0.7 for the subscale, which showed a good internal consistency for the questionnaire. In addition, the questionnaire was tested through a pilot study on a sample of 25 participants. Furthermore, minor modifications in phrasing were made to some items of the questionnaire.

### 3.2. Research Hypotheses

#### 3.2.1. Main Hypothesis

There is a significant relationship between nutritional science and the knowledge development approach.

#### 3.2.2. Secondary Hypotheses

1) There is a significant relationship between nutrition education and research and the knowledge development approach.

2) There is a significant relationship between proper solutions for people's nutritional problems and the knowledge development approach.

3) There is a significant relationship between a culture of nutrition and the knowledge development approach.

It should be noted that the results of research were organized into two descriptive and analytic sections, where one-dimensional tables are given in the section representing the descriptive results, and the analytic results of the research are represented in the next section.

## 4. Results

Of the participants, 66.8% ( $n = 127$ ) were male, 77.4% ( $n = 147$ ) were married, and 54.2% ( $n = 103$ ) were in the age group of 30 - 40 years. In terms of educational level, 44.2% ( $n = 84$ ) of the respondents held an MSc. About one third of participants (31.6%) had 10 - 15 years of work experience (Table 1).

The value of Spearman's correlation coefficient was calculated to determine the relationships of the knowledge development approach with nutritional science,

nutrition education and research, proper solutions for people's nutritional problems, and a culture of nutrition (Table 2). As shown in the Table 2, there was a significant relationship between nutritional science and knowledge development approach ( $P < 0.001$ ). The value of Spearman's coefficient was found to be 0.491 for a sample of size 190. In addition, a significant relationship between nutrition education and research and the knowledge development approach was observed, with a Spearman's coefficient of 0.718 ( $P < 0.001$ ). The Spearman's correlation coefficients were 0.615 and 0.480 for the relationships of the knowledge development approach with proper solutions for people's nutritional problems and a culture of nutrition, respectively, and the relationships were statistically significant ( $P < 0.001$ ).

The correlation between the knowledge development approach and the abovementioned variables were again tested using Kendall's tau correlation coefficient test and all relationships between variables remained significant at the level of  $P < 0.001$ .

**Table 1.** Distribution of Demographic Characteristics of the Study Participants

Variables	Values <sup>a</sup>
<b>Gender</b>	
Male	127 (66.8)
Female	63 (33.2)
<b>Marital status</b>	
Married	147 (77.4)
Single	43 (22.6)
<b>Age, y</b>	
< 30	17 (8.9)
30 - 40	103 (54.2)
40 - 50	35 (18.4)
> 50	35 (18.4)
<b>Educational level</b>	
BSc	63 (33.2)
MSc	84 (44.2)
PhD	43 (22.6)
<b>Work experience, y</b>	
5 - 10	54 (28.4)
10 - 15	60 (31.6)
15 - 20	33 (17.4)
> 20	43 (22.6)

<sup>a</sup>Values are expressed as No. (%).



**Table 2.** Spearman's Correlation Coefficients for the Relationships Between the Knowledge Development Approach and the Other Variables

Variable	Spearman's Value	P Value
Nutritional science	0.491	< 0.001
Nutrition education and research	0.718	< 0.001
Proper solutions for people's nutritional problems	0.615	< 0.001
Culture of nutrition	0.480	< 0.001

## 5. Discussion

Due to the multidimensionality of nutrition science (37), deep knowledge is essential for the perception of food system. This work is based on searching and studying subjects and main topics to achieve healthy nutrition and suitable nutrition solutions. Attending to these two factors is necessary for promoting safe nutrition and improving the health condition of individuals and society. Many researchers have emphasized the necessity of education, creative positive sights, and customs. They assert that this movement has been successful in creating knowledge, science, and insight into positive nutrition to promote the safety and wellbeing of people and their communities (38). Policymakers should create widespread policies and a suitable strategy to facilitate knowledge about the safety of food and healthy nutrition. In addition, they should increase the awareness and scientific knowledge of families, create a suitable place to access safe, useful food resources of high quality, improve families' economic power, decrease metabolic syndrome disease, and increase the level of health of the society and individuals (39).

From the results from the present study, the following conclusions can be deduced:

1) Effective enhancement and participation in an academic community will be important in the future of food and nutrition security; however, major gaps and weaknesses also exist in this context.

2) The main weaknesses in relation to the lack of clear policies and procedures include focusing on only Tehran, Iran; the need to overcome bureaucracy; and problems related to motivation, capital, and international communications.

3) Qualitative and quantitative improvement of research is not possible without access to skilled experts and researchers.

4) To solve these problems, it will be beneficial to pay more attention to the role of universities, facilitate intellectual communication among professors in Tehran and other provinces, ensure that Iranian professors are employed abroad, develop educational and research cooperation with foreign countries, and ensure that facilities for international cooperation put in place by united nations (UN) agencies are used.

The following recommendations can be made for improving nutrition education using the knowledge development approach:

- It is necessary to support the development of service centers in the agriculture and food industry, especially in terms of market development and technology;
- The production model should be modified with an emphasis on animal, fruit, and vegetables products;
- The nutritional value of food crops should be increased;
- Vegetable consumption should be extended in rural areas;
- Government and private sector organizations should be developed and expanded to help residents gain easy access to fruits and vegetables in big cities;
- Production costs and prices for food products should be reduced;
- A good, traditional food supply should be promoted;
- Support should be provided in the form of investment in the development of processing industries and the maintenance of agricultural products;
- Knowledge should be applied to resolve problems in the community;
- Advocacy should be increased to reveal latent problems and affect attitudes, priorities, and policies; and
- Skilled scholars should be fostered to construct and use of knowledge in national development.

This study had some limitations. For instance, a subjective method was used to collect the required data. Subjective measures are often susceptible to individual motivation. In addition, according to the literature review, no similar study was found in this area.

## Footnote

**Authors' Contribution:** Baratali Asghari: study design, manuscript drafting and data analysis; Maryam Yaghoubi, Esfandiar Azad Marzabadi, Seyed Masoud Pour Saeed, Mansour Babaei: data collection; Ali Mehrabi Tavana, Mostafa Ghanei: consultation during the design and implementation of the study and editing of the manuscript.

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