



# Eating Behaviors and Food Habits of Veterans; A Case Study in Zahedan City

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## ABSTRACT

**Aims** Veterans may have improper eating behaviors and food habits. This study aimed to investigate the eating behaviors and food habits of veterans via the nutritional knowledge, attitude, and practices model in Zahedan City.

**Instruments & Methods** In a descriptive, cross-sectional study, 369 veterans admitted to the Veterans Foundation in Zahedan were selected. After recording demographic characteristics, we assessed participants' eating behaviors, nutritional knowledge, attitude, and practice through a questionnaire. Statistical analysis was done by SPSS 21 software.

**Findings** Most participants consumed 3 meals (51.20%), and salty foods, fried potato, eggplant and vegetables in golden form or roasting, respectively. The most intake oil was liquid as frying oils. They mostly stored raw meat and bread in plastic containers and consumed tea, coffee and watery foods in warmish form. 72.90%, 63.40%, and 19.80% of nutritional knowledge, attitude, and practices were in good status, respectively. There was a negative correlation between age and knowledge ( $r=-0.12$ ,  $p=0.02$ ) and a positive correlation between family size and practice ( $r=0.15$ ,  $p=0.01$ ).

**Conclusion** The veterans of the study use suitable and acceptable methods in the processing of different foods, including the use of liquid oil and stored meat. Nevertheless, they also consume salty foods and use more plastic containers. The level of their knowledge and attitude is appropriate, but the level of practice in the participants is not optimal.

**Keywords** Nutritional Status; Knowledge; Attitude; Practice; Veterans

## CITATION LINKS

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## Introduction

The ever-increasing changes in lifestyle and food patterns cause health problems and death in various vulnerable groups, which puts different groups of society at risk with the spread of chronic diseases in developing and developed countries [1]. Healthy eating and lifestyle habits are required to improve the well-being of people [2]. Inappropriate diets, along with a lack of physical inactivity, increase the risk for obesity, heart disease, and Type 2 Diabetes (T2DM) [3]. Food behaviors have a broad concept and this process with the food choices made have significant consequences in terms of lifestyle and continuity of health for the individual and society [4]. Nutritional behaviors are influenced by many factors, such as food availability, food preferences, portion sizes or food rations, cultural values, family beliefs, food processing, and storage. Experience and social teachings can change behaviors and eating habits [5]. Nutritional habits are an influential indicator of eating and drinking behavior. It includes a set of various nutritional functions related to food selection, preparation and serving [6]. The main factors affecting the adoption of healthy or unhealthy eating habits include beliefs, genetic factors, and environmental factors that interact with each other and have different effects [7].

Modifying one's eating behaviors is an important step toward preventing non-communicable diseases as well as reducing and controlling disease complications. In this context, nutrition education is an effective practical method to promote nutritional knowledge, public awareness, and public health [8]. Nutritional knowledge can have significant effects on selecting a healthy and nutritious diet [9]. In addition, inappropriate nutritional knowledge is a major factor influencing nutritional problems and can influence dietary practices [10]. Proper nutritional attitudes and beliefs of the community significantly improve healthy eating [11].

Among people, optimal dietary intake is essential for veterans and the military environment due to their physical and mental requirements [12,13]. Malnutrition is associated with higher mortality rates in veterans [14, 15], in particular in the elderly [16], and food insecurity affects the low diet quality in veterans [16-18]. They are also at risk for overweight and obesity compared to other people and may experience increased rates of eating disorders [19]. Studies have reported rates of 32.70% obesity [20] and 33.90% [21] among veterans. It was reported that the obesity rate was 12.00% higher in veterans compared with service members, which highlights military separation as a high risk for being overweight [22]. In overweight and obese veterans, low fruit and vegetable consumption is often associated with tobacco use [23]. Unhealthy dietary and lifestyle habits, including smoking, are common in veterans [24-26], increasing the risk of cancer and

Cardiovascular Diseases (CVD) [27]. It was reported that demographic risk factors, trauma, and the military environment increase the risk for veterans [28]. The incidence of trauma increases in eating disorders in veterans [19].

Bankoff *et al.* investigated eating behavior in male veterans and showed that veterans may experience eating disorder and food addiction symptoms [29]. Cuthbert *et al.* studied eating disorders in veterans, which could lead to overweight and obesity [28].

Veterans are a special group which suffer from physical, therapeutic, mental, and psychological problems that can lead to inability to continue living. Therefore, it is important to study various aspects of their health, such as eating habits and nutritional literacy and behaviors. Therefore, this study aimed to evaluate eating habits and behaviors in veterans of Zahedan.

## Instruments and Methods

This cross-sectional study was conducted on all veterans from 19 February 2021 to 21 June 2021 in Zahedan city. The statistical population included 2000 veterans, and 322 veterans were selected based on the following formula:

$$n = \frac{Nz^2pq}{Nd^2 + z^2pq} = 322$$

$$z=1.96, p=0.5, d=0.05, N=2000$$

The above formula suggested a sample size of 322 participants. However, we finalized the sample size at 369 individuals to account for possible attrition.

### Data collection

Data were collected using three questionnaires; 1) Demographic information, 2) Eating habits, and 3) Nutritional behaviors.

**Demographic information:** Demographic characteristics included age, job, education, married status, weight, height and Body Mass Index (BMI), having a percentage of veterans, and family size. According BMI index, participants were categorized as underweight, normal weight, overweight, and obese.

**Eating habits:** Eating habits were recorded by a questionnaire comprising 12 questions. This questionnaire was provided to the veterans, and the results were expressed in the number and percentage of each question.

**Nutritional behaviors:** Nutritional behaviors including nutritional knowledge, attitude, and practices were evaluated. The data for nutritional knowledge were collected by a questionnaire with 11 questions that scored based on 0 as false and 1 as true. A total knowledge score of 19-26, 12-18, and less than 12 indicated good, moderate, and weak knowledge, respectively. The data for nutritional attitude were collected by a questionnaire with 6 questions, which classified as agreement (2),

disagreement (0) and lack of opinion (1). A total attitude score of 9-12, 5-8, and 0-4 represented good, moderate, and weak attitude, respectively. Also, the data for nutritional practice were collected by a questionnaire with 10 questions that scored based on 0 as false and 1 as true. A total practice score of 12-15, 7-11, and less than 7 represented good, moderate, and weak practice, respectively.

#### Statically analysis

Data were presented as mean±SD and distribution frequency. Statistical analysis was performed by SPSS 21 software. Pearson's correlation coefficient and chi-square test were used to determine the relationship between variables. P-value <0.05 was considered statistically significant.

### Findings

The mean age of the participants was 48.40±11.37 years, the mean body weight was 74.75±13.00 kg, the mean height was 174.50±8.87 cm, the mean BMI was 24.52±3.72 kg/m<sup>2</sup>, and the mean of family size was 2.10, respectively. Based on literacy level, 60 people (16.3%) had preliminary education, 135 people (36.6%) had high school education, 142 people (38.5%) had academic education, and 32 people (8.7%) were illiterate. In terms of occupation, 36 people (9.8%) were housewives, 36 people (9.8%) were retired, 72 people (19.5%) were workers, 163 people (44.2%) were employees, and 62 people (16.8%) were free-lancers. Most veterans (n=347, 94%) were married, and the rest were single (n=22, 6%).

The most participants consumed 3 meals. 35.2% consumed no salt foods, and 49.1% consumed medium-salt foods. Most veterans fried potato and eggplant as well as vegetables in golden or roast forms. The most intake oil was liquid or frying oils. They mostly stored meat and meat processes raw. The majority of participants drank tea and coffee as lukewarm and watery foods in warmish form. Most of the water and bread storage containers were also plastic (Table 1).

The cooking utensils used by 158 people (42.8%) were Teflon, and 82 people (22.2%) were copper. Other materials of cooking utensils included zinc (n=20, 5.4%), aluminum (n=49, 13.3%), enamel (n=16, 4.3%), cast iron (n=13, 3.5%), steel (n=13, 3.5%), Pyrex (n=6, 1.6%), and others (n=12, 3.3%).

The mean scores of nutritional knowledge, attitude, and practice of the participants were 16.31±2.97, 9.2±2.32, and 10.23±2.61, respectively. 72.90%, 63.40%, and 19.80% of nutritional knowledge, attitude, and practices were in good status, respectively. In terms of practice, most of them had a moderate status (Table 2).

**Table 1** Frequency distribution of eating habits of the participants

Variables	No. (%)
<b>Number of meals</b>	
<3	22 (6.0)
3	189 (51.2)
4	85 (23)
5	58 (15.7)
>6	15 (4.1)
<b>Drinking water storage containers</b>	
Plastic	145 (39.3)
Steel	52 (14.1)
Porcelain	21 (5.7)
Glassware	123 (33.3)
Others	28 (7.6)
<b>Bread storage containers</b>	
Plastic	217 (58.8)
Steel	35 (9.5)
Porcelain	18 (4.9)
Glassware	47 (12.7)
Others	52 (14.1)
<b>Intake oil</b>	
Solid	42 (11.4)
Semisolid	55 (14.9)
Liquid	130 (35.2)
Special frying liquid	135 (36.6)
Others	7 (1.9)
<b>Frying</b>	
Roast	109 (29.5)
Golden	165 (44.7)
Brown	56 (15.2)
None frying	39 (10.6)
<b>Frying vegetables</b>	
Roast	161 (43.6)
Golden	95 (25.7)
Brown	51 (13.8)
None frying	62 (16.8)
<b>Tea and coffee intake</b>	
Hot	115 (31.2)
Warmish	206 (55.8)
Cold	33 (8.9)
Non-intake	15 (4.1)
<b>Watery foods</b>	
Hot	117 (31.7)
Warmish	210 (56.9)
Cold	27 (7.3)
Non-intake	15 (4.1)
<b>Salt intake</b>	
Yes	84 (22.8)
Often	155 (42)
No	130 (35.2)
<b>Food quality</b>	
Low salt	154 (41.7)
Medium salt	181 (49.1)
High salt	34 (9.2)
<b>Storing meat and meat products in refrigerator</b>	
Raw	273 (79.4)
Boiled	40 (10.8)
Fried	36 (9.8)

**Table 2** The frequency distribution of nutritional knowledge, attitude and practices in participants

Variables	Weak	Moderate	Good
Knowledge	9 (2.40%)	91 (24.70%)	269 (72.90%)
Attitude	6 (1.60%)	129 (35.00%)	234 (63.40%)
Practice	15 (4.10%)	281 (76.20%)	73 (19.80%)

There was a negative significant correlation between age and knowledge ( $r = -0.12$ ;  $p = 0.02$ ) and a positive significant correlation between family size and

practice ( $r=0.15$ ,  $p=0.01$ ). No significant correlation was observed between other demographic variables with knowledge, attitude and practice (Table 3).

**Table 3)** Correlation between demographic variables with nutritional knowledge, attitude and practice in participants

Variables	Knowledge	Attitude	Practice
Age	$r=-0.12$ ; $p=0.02$	$r=-0.04$ ; $p=0.34$	$r=0.04$ ; $p=0.38$
Family size	$r=-0.06$ ; $p=0.19$	$r=0.05$ ; $p=0.320$	$r=0.15$ ; $p=0.01$
Body mass index	$r=-0.05$ ; $p=0.28$	$r=-0.05$ ; $p=0.28$	$r=-0.03$ ; $p=0.53$
Education level	$r=-0.08$ ; $p=0.22$	$r=0.07$ ; $p=0.350$	$r=0.07$ ; $p=0.36$
Marital status	$r=-0.06$ ; $p=0.19$	$r=0.05$ ; $p=0.320$	$r=0.04$ ; $p=0.38$
Job	$r=-0.05$ ; $p=0.28$	$r=-0.05$ ; $p=0.28$	$r=0.07$ ; $p=0.36$

## Discussion

This study aimed to investigate the eating behaviors and food habits of veterans in Zahedan city. Our findings showed that the studied people were middle-aged with a normal BMI. Most participants were an employee and had a diploma and academic education.

The present study showed that most participants consumed 3 meals (51.20%). A positive correlation between the number of meals received and improvement in body composition was reported [30]. Most participants used salty foods. Several studies have reported the adverse effects of salty foods on health [31, 32]. It seems veterans must consider a special program for decreasing salt consumption. Based on findings, most veterans fried potato, eggplant, and also vegetables in golden and roast forms. It was reported that roasting conditions can increase deliciousness and healthiness via protecting antioxidants [33]. However, modifying their daily diet seems necessary. Thus, most veterans selected an appropriate procedure for frying potatoes, eggplant, and vegetables. In addition, liquid and frying oils are mostly utilized for frying. Oils with a significant amount of double bonds and free fatty acids are prone to oxidation. However, consuming liquid oil and frying oil decrease serum lipid levels and help to improve healthiness [34]. Most participants usually stored meat in raw form (80.0%). Freezing meat and meat processes help to maintain nutrient values, while cooking and storing may cause interactions that result in decreased nutrient values. The veterans mostly consumed tea, coffee, and watery foods in warmish form. Hot drinks and foods may damage the digestive tract, and thus consumption of warmish foods helps to improve freshness and healthiness. In addition, most containers for storing bread and water were plastic. The application of plastic containers may be a challenge because these may threaten healthiness [35]. Thus, they must consider cautious aspects. The cooking dishes were almost copper and aluminum. These dishes may release trace elements

into foods and cause toxicity that must be considered cautious aspects during food cooking and should not be used constantly.

Our findings also showed that participants had a desirable status for knowledge and attitude while they had a moderate condition for practices. The results are consistent with previous studies for infection prevention [36,37] and cardiovascular disease prevention [38] in the study population. However, increasing knowledge was negatively associated with increasing age. Older people may not accept updated information and only accept traditional systems. Knowledge of nutrition has a positive effect on selecting healthy and nutritious diets [9]. The results confirm that elderly veterans may need educational programs to improve their knowledge. Knowledge has a closed relation with practice.

The logical action theory emphasizes the association between beliefs, attitudes, and behaviors. Modification of knowledge and attitude improves behavior.

Inappropriate nutritional knowledge is a major factor influencing nutritional problems and can influence dietary practices [10]. In addition, our results confirmed non-significant relation between family size, BMI, education levels, married status, and job with knowledge. In addition, our findings showed that attitude did not have any relation with demographic characteristics. Understanding the nutritional attitude and beliefs of the community significantly improve healthy eating [11]. The result of the present study is not in agreement with previous studies that showed a significant relationship between attitude and education levels [39, 40]. It seems the differences could be attributed to education levels in the studied population in the current study and previous studies; because the most studied people had an academic education level. The results also showed a negative relationship between practice level and family size.

It is suggested to implement supplementary, participatory, and advisory programs to improve the nutrition practice of veterans. It is also recommended to use the capacity of households and local facilities in addition to education and nutritional support programs. More studies are needed to understand the factors affecting KAP in participants.

This study was conducted on veterans in Zahedan city and cannot be interpreted for all populations. The limitations of this study include the small number of samples and its cross-sectional nature, which hindered the temporal evaluation of the results. It was difficult to conclude a basic relationship between different factors concerning the aim of the study. Hence, more studies with a larger sample size should be conducted in modifying the lifestyle of the studied community. It is recommended that more extensive studies be conducted on larger populations and with longer follow-ups to obtain more conclusive results.

## Conclusion

The veterans of the study use suitable and acceptable methods in the processing of different foods, including the use of liquid oil and stored meat. Nevertheless, they also consume salty foods and use more plastic containers. The level of their knowledge and attitude is appropriate, but the level of practice in the participants is not optimal. There is a negative correlation between age and knowledge level that needs to be considered a nutritional intervention program in the following target group. However, poor levels of practice are observed. Considering the relationship between indicators including knowledge, attitude, and practice suggests that improving the nutritional awareness of the participants can help to modify their attitude and consequently, their practice.

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