

# Diet and Gallstones: A Study among Gall Stone Patients Admitted In Allied Hospital and District Head Quarter (DHQ) Hospital, Faisalabad

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## Abstract

**Background:** Gallstone is a major health issue worldwide. The prevalence of gallstone varies according to the region, ethnicity, age, and sex. The main objective of the study is to find out the risk factor for the formation of gallstone in Faisalabad district. **Study design:** It is a cross-sectional study. **Place and duration of study:** The study was conducted in surgical wards of Allied hospital and District Head Quarter (DHQ) hospital, Faisalabad from January 2018 to July 2018. **Methodology:** A total number of 124 patients (M: 60 and F: 64) who have undergone cholecystectomy due to gallstone were selected for the study. Data was gathered by taking interviews with the help of a semi-structured questionnaire to know the age, sex, and dietary habits. **Results:** The range of age group was 34 to 76 years. While the median age for male was 62 and female 47.5 years. All the female respondents were married and 34% of female respondents were using oral contraceptives. A diverse dietary pattern among respondents was observed. Family income of 52.4% of respondents was 10,000 to 25,000 rupees per month and daily routine life of respondents showed that majority (59.7%) of them spending sedentary life. **Conclusions:** Increased frequency of cholelithiasis was found in the 41 years-60 years age group. Female gender, middle age, sedentary life, and unhealthy dietary pattern are common risk factors of gallstone formation.

**Keywords:** Gallstones; Dietary risk factors; Epidemiologic risk factor; Faisalabad

## Introduction

The crystalline deposit in the gallbladder is widely known as gallstone and nowadays it is a major health issue in the entire world especially in developed countries [1-3]. The size and shape of gallstones vary from as small as grain to as large as a golf ball [4]. The formation of gallstone was found dating back to 1000 BC in gallbladders of Egyptian mummies [5].

The prevalence of gallstone varies based on different countries, regions of the country and ethnic population and its prevalence increases with age in both male and female especially between 50 years-60 years age group [6-9]. The estimated prevalence of gallstone is 5% to 25% but it is higher in women and older age groups of Western countries. Based on the report of ultrasonography, the prevalence of gallstone is found to be 22% to 54% in developed countries including US, Italy, UK, and Scandinavian nations, 5.2% to 10% in African and 3.2% to 6.1% in the Asian population [10,11]. Various studies argued that gallstone disease is common in both men and women, but it was found that the risk of having gallstone is two times higher in women having three or more children, used oral contraceptives and full-term pregnancy [12-18].

According to their composition the gallstones can be divided into three major categories cholesterol, pigment and a mixed stones (combination of both cholesterol and pigment) [19-23]. Some studies found association between gallstone and elevated serum

cholesterol or triglycerides, obesity, less physical activities in routine life and diabetes or increased serum glucose [9,12,24-26]. The negative association was documented between fruits and vegetable intakes with gallstone formation as compared to fried or spicy food and cooking oils which increase the risk of formation of gallstone [27,28]. The main objective of the study was to find out the risk factor for formation of GS among the patient admitted in surgical wards of Allied hospital and District Head Quarter Hospital, Faisalabad district.

## Inclusion and exclusion criterion

Both female and male participants from Faisalabad district, who have undergone cholecystectomy due to gall stones, were recruited for the study after obtaining written consent. The respondents were informed that they have the freedom to leave the interview at any time if they like to do so.

## Materials and Methods

The study was carried out in surgical wards of Allied hospital and District Head Quarter (DHQ) hospital, Faisalabad. All

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the 124 respondents (M: 60 and F: 64) who have undergone cholecystectomy due to gall stones in surgical wards of Allied hospital and DHQ, Faisalabad from January 2018 to July 2018 were recruited.

All the respondents were interviewed regarding their dietary habits like the use of dairy products, cooking oils, fried foods, fruits and vegetables, source of drinking water, etc. While the information regarding pregnancies and the use of oral contraceptives was also obtained from female respondents.

After collection, the data was coded and entered into SPSS (Statistical Package for the Social Sciences) database and analyzed with SPSS 21. Results were obtained by the frequency distribution and cross-tabulation of the different variables. The Chi-square test was used to determine the significance between variables. The p-value was set at <0.05 for statistical significance. The ethical approval was obtained from the concerned department of University of Sindh, Jamshoro.

## Results

### Socio-demographic characteristics

It was observed that the majority of gallstone patients 52.4% have 10,000 to 25,000 Pak rupees per month family income (Table 1). The range of age group was 34 years to 76 years. While the median age for male was 62 and female 47.5.

### Dietary habits

The majority of respondents, 63.7% did not use fruits even a single time in a week and 72.6% did not use dairy products

**Table 1: Socio-demographic characteristics of respondents.**

Socio-Demographic characteristics	Percentage
<b>Mean age (years)</b>	
Male	62.52 ( SD: ± 7.08)
Female	48.19 (SD: ± 7.58)
<b>Age (years/groups)</b>	
31-40	8.1
41-50	28.2
51-60	33.1
61-70	25
71-80	5.6
<b>Family Income (Pak rupees/month)</b>	
10,000 to 25,000	52.4
26,000 to 40,000	23.4
41,000 or above	24.2
<b>Educational status</b>	
Illiterate	17.7
Religious education	19.4
below Matric	39.5
Intermediate or above	23.4
<b>Source of drinking water</b>	
Groundwater	57.3
Government water supply	27.4
filtered water	15.3
<b>Number of pregnancies (N= 64)</b>	
1 to 3	32.8
4 or above	62.5
No pregnancy	4.7

(Table 2). According to data 65.6% female respondents have not used contraceptives. It was found that 40.3% respondents were physically active (walking, jogging or running) in their routine life.

### Statistical analyses

It revealed that there is a highly significant association between family income and use of deep-fried foods (<0.001), fruits and vegetables (<0.001), dairy products (<0.001) and walk/exercise (0.002). While the results are not significant between education and the use of deep-fried foods (0.178) along with walk/exercise (0.071) (Table 3).

## Discussion

Nowadays, gallstone disease is a common health problem in Pakistan. The treatment of Gallstone (GS) is very expensive in Pakistan. Treatment of GS leads to a burden on the health management system of the country and patients.

A total of 124 patients (48.4% male and 51.6% female) from two different hospitals of the Faisalabad district who were undergone through cholecystectomy due to gallstone

**Table 2: Dietary habits of Respondents.**

Risk factors/Dietary habits of Respondents	Percentage
<b>Use of fruits (number/week)</b>	
No	63.7
01-Mar	24.2
4 or above	12.1
<b>Use of Dairy products (number/week)</b>	
No	72.6
01-Mar	16.9
4 or above	10.5
<b>Usage of cooking oil</b>	
Yes	54
No	46
<b>Use of Deep-fried foods (number/week)</b>	
No	21
01-Mar	26.6
4 or above	52.4
<b>Use of Homeo or herbal medicine</b>	
Yes	64.5
No	35.5
<b>Daily routine life</b>	
Sedentary	59.7
Daily physical activity	40.3
<b>Use of oral contraceptives by female respondents (N= 64)</b>	
Yes	34.4
No	65.6

**Table 3: Socio-demographic characteristics of respondents.**

Independent variables	Dependent Variables	p value
Family income	Use of deep-fried food	<0.001
	Use of fruits and vegetables	<0.001
	Use of dairy products	<0.001
Education	walk/exercise	0.002
	Use of deep-fried food	0.178
	Use of fruits and vegetables	0.002
	Use of dairy products	<0.001
	walk/exercise	0.071

from January 2018 to July 2018, were included in the study. According to various studies, women have a greater risk of gallstone disease as compared to men of all ages [4,29,30]. The results of ongoing research strengthen the results of the previous study in Netherland where the rate of cholecystectomy was 39% in males and 50% in females for all age groups [31].

In the present study, the diverse dietary pattern among respondents was identified as an unhealthy dietary pattern, like non-use of dairy products (72.6%) and use of deep-fried food (like deep fried potatoes (chips), Samosa and Pakoras) >5 times in a week (52.4%). Studies suggest that a decrease in fiber contents and excess use of refined carbohydrates are possible risk factors for the development of gallstones [32,33]. Unhealthy dietary pattern is associated with the prevalence of increased gallstones risk. Family income of 52.4% of respondents was 10,000 to 25,000 rupees per month and daily routine life of respondents showed that majority (59.7%) of them spending sedentary life. Almost 32% of female respondents were pregnant 4 times or above. Nearly 34% of female respondents were using oral contraceptives. The groundwater is the main source of drinking water of 57.3% respondents. All the female respondents were married, so this study proves the results of other studies carried out in Australia and Karachi, which found a high association between marital status and gallstone disease [34,35].

Different studies argued that GS is common in all age groups, but the most prevalence in the 4th or 5th decade of life [36-38]. In this study also a higher proportionate of respondents belonged to age group 41-50 years (28.2%) and 51-60 (33.1%). Similar findings have been reported in previous studies that that the occurrence of gall stone was found in the age group 30 years-59 years of both male and female. In the present study, the peak age range for the GS in patients of both sexes was recorded as 41 years-60 years, while in United States of America (USA) or rest of the Europe, peak age range of gallstone diseases have been reported in patients over 60 years age group [39,40]. The earlier onset of gallstone diseases in Faisalabad seems to be associated with the unhealthy dietary pattern. However, further research is needed to address this aspect.

## Conclusion

In the present study, we found some dietary habits and lifestyle common among male and female respondents like the use of deep-fried food, consumption of groundwater and less use of dairy products along with a sedentary lifestyle. Thus, female gender, middle age, sedentary life, and unhealthy dietary pattern are common risk factors of gallstone formation.

## Recommendation

A balanced diet and an active lifestyle may reduce the risk of GS. Therefore, the government should launch an awareness program to sensitize people regarding a healthy diet.

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