

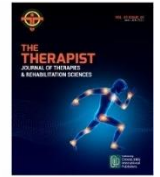


THE THERAPIST

JOURNAL OF THERAPIES & REHABILITATION SCIENCES

<https://thetherapist.com.pk/index.php/tt>

Volume2, Issue 1(Jan-Jun 2021)



Original Article

Diet and Physical Activity Among Gallstone Patients

Ayesha Ahmed¹, Muhammad Arif Khan¹, Sidra Khalid¹, Qurat-ul-Ain Bhatti¹, Riffat Yousaf¹ and Aisha Kaleem¹

¹University Institute of Diet and Nutritional Sciences, Faculty of Allied Health Sciences, The University of Lahore, Lahore, Pakistan

Key Words:

Gallstones, Dietary Factors, Physical Activity

How to Cite:

Ahmad, A., Khan, M. A., Khalid, S., Bhatti, Q.- ul-A., Yousaf, R., & Kaleem, A. (2021). Diet and Physical Activity Among Gallstone Patients. *THE THERAPIST (Journal of Therapies & Rehabilitation Sciences)*, 2(1).

<https://doi.org/10.54393/tt.v2i1.21>

Corresponding author:

Sidra Khalid
Faculty of Allied Health Sciences,
The University of Lahore, Lahore,
Pakistan.
Sidrakhalid.uaf@gmail.com

Article History

Received: 22nd April 2021

Accepted: 29th May 2021

Published: 30th June 2021

ABSTRACT

Gallstones disease has become the most common disease now a days. The dietary factor and physical activity play an important role in the development of gallstones. These were the major risk factor in gallstones. **Objective:** The aim of the study is to find the linked between dietary habits and physical activity with gallstones **Methods:** This was a cross-sectional study with the sample size of 100, conducted at Sir Ganga Ram Hospital and Mayo Hospital, Lahore. 4 months was the duration of the study. All the adult's male and female patients of gallstones above 30 years old and both indoor and outdoor patients of medical, surgical units were included. All non-corporative patients were excluded **Results:** 100 males and females were taken in this study. 56% males and females had more than 200mg/dl of cholesterol level, majority of males and females did not do indoor exercise that was 59%, 63% of males and females walk less than 30 minutes and 55% of males and females did not climb stairs and 72% males and females had sedentary lifestyle. 70% males and females eat outside only on weekend and holidays, 91% males and females eat fatty food and 78% males and females eat junk food and Results of current study 85% males and females eat 1 cup of sweets, 48% males and females take 1 piece of white bread and 95% males and females drinks 1 cup of whole milk **Conclusion:** Increased cholesterol level and sedentary lifestyle were increasing the incidence of the gallstones. Refined foods, junk foods and fried foods replaced healthy food which was the major cause of gallstones.

INTRODUCTION

Bile is a fluid secreted from the liver, stored in the gallbladder and released in to the duodenum when oily foods enter the duodenum; it blends fats in the intestine and forms compounds with fatty acids to help their absorption. The main components of bile are cholesterol, bilirubin and bile salts. Most gallstones are colorless cholesterol stones composed of cholesterol, bilirubin and calcium salts [1]. Gallstones form when cholesterol and mineral in the bile clumps together and forms stones in the gallbladder [2]. Polyunsaturated fat, monounsaturated fat, fiber and caffeine play preventive role in the formation of gallstones, vegetarian diet also have preventive role in the formation of gallstones [3]. The diets which contain fiber, vegetable proteins, nuts, calcium, vitamin C, coffee, and alcohol in addition physical activity plays protective factors [4]. Diet rich in high fat, refined sugar and low fiber are positively linked with the formation of gallstones [5]. The most effective risk factor for the formation of gallstones is the diets which are rich in fats, refined carbohydrates and decrease in fiber content [6]. A delicate carbohydrate causes obesity and lift plasma triglyceride and fasting plasma insulin level, and lower plasma HDL cholesterol [7]. Excessive fiber consumption in the form of wheat bran lowers the cholesterol saturation of bile. Fibers have a defensive effect towards cholesterol gallstones by using accelerating intestinal transit and as a result lowering the deoxycholate in bile.⁷ Components of coffee accelerate cholecystokinin release, which increase gallbladder motility, inhibit gallbladder fluid absorption and reduce cholesterol crystallization in bile and rise intestinal motility [6]. Younger women with gallstones skip more breakfast than women who are without gallstones. In males and women shorter overnight fasting is protective against gallstones [7]. Cholesterol-rich gallstones are linked with rapid weight loss and low-caloric diet [8]. Sedentary lifestyle is completely linked with the risk of gallstones whereas regular exercise with control diet improves metabolic abnormalities in both obesity and gallstones [6]. In Europe and North America cholesterol-rich stones are most common [8]. In American Indian (60%-70%) has gallstones disease while in Hispanics of mixed Indian



origin disease is decreasing. In developed countries 10%-15% while adults have gallstones. In Black Americans, East Asia and sub-Saharan African frequency was reduced. Cholesterol stones are in majority, 15% are black pigment and in East Asian brown pigment stones in bile duct are present, in developed countries [4].

A study was performed by Gu YC *et al.*, 2012, to discover the metabolism-related risk factor of cholelithiasis among residents in Beijing. The data was collected by taking history of previous disease, physical examination and ultrasonography of cholelithiasis patients. Two groups were examined healthy group and diseased group. The result stated that total cholesterol, triglyceride, LDL cholesterol, fasting blood glucose, BMI and systolic blood pressure were positively linked with the occurrence of cholelithiasis whereas HDL cholesterol and diastolic blood pressure had no link [9]. A study was performed by Ansari-Moghaddam A *et al.*, 2016; to assess the prevalence and possible risk factor of gallstones disease. Cross-sectional study was done. 1522 males and females data was collected by questionnaire and ultrasonography. The results indicated that risk was 2.6 times higher in people age 45, females were 2.73 times and unmarried was three times higher than aged 39-44, males and married people. 66% daily physical activity reduces the risk of gallstones. The outcomes of the study were increasing age, female gender were risk factor where as physical activity and marriage as defending factors in etiology of gallstone disease [10].

A study was performed by Henao-Morán S *et al.*, 2014 physical activity can reduce the risk of chronic illnesses together with gallstones. This study indicated that link between recreational physical activity (RPA) and hazard of asymptomatic gallstones in adult Mexican women. The data was collected by a cross-sectional analysis. Mexican ladies aged 17-94 years, without a record of gallstone (GS) or cholecystectomy. A questionnaire was used to collect data on weight alteration, gynecological health history, cholesterol-lowering medicines and diuretics, account of diabetes mellitus type 2 (DM2), Physical activity and diet. According to the result 12.3% were diagnosed with asymptomatic gallstones these ladies were older, higher BMI and prevalence of diabetes mellitus than those without asymptomatic gallstones. These conclusions support the hypothesis that recreational physical activity may protect against asymptomatic gallstones [11]. A study was conducted by Channa NS *et al.*, 2013; on the risk factors and role of diet as a risk factor for gallstones formation. 654 gallstones patient and 675 control patients were observed. The result indicates that early marriages, sun exposure, oral contraceptives, psychological or emotional problems and illiteracy were positively associated with the gallstones.

The major risk factors for gallstones were illiteracy, followed by the consumption of green chilies and fried food and early marriages in southern Sindh, Pakistan [12]. A study was performed by C-J Tsai *et al.*, 2005 on the dietary carbohydrates and glycemic load and the occurrence of symptomatic gall stone illness in men. The dietary records turned into accrued by way of semi quantitative meals frequency questionnaire, during 12 years 1810 new cases of systemic gallstones were recorded. The study claimed that the high intake of carbohydrates, glycemic load and glycemic index increases the risk of gallstones disease in men [13]. A study was performed by Sukij Panpimanmas *et al.*, 2009, on the risk factor of the gallstones disease in the Thai population. In study 407 members were studied in which 207 were with gallstones and 200 without gallstones disease. They examined age, BMI, use of oral contraceptive, diabetes mellitus, dietary history and smoking. The result indicated that BMI below 25 compared with the BMI higher 25 have higher risk, high fat meat consumption and smoking are at high risk for the formation of gallstones [14].

A study was performed by Goktas SB *et al.*, 2016; the goal of study was to find the elements affecting the development of gallstone types of cholesterol and pigment stones. Descriptive data of 164 patients were collected. The result indicated that, the individuals with anemia, going through menopause and consuming oil and do not doing exercise were having cholesterol stones while obesity and having liver disease and those individuals who did not take milk were having pigment stones [15].

A study was conducted by Barré A *et al.*, 2017; to observe the relationship between diet and cholecystectomy risk in French cohort. Food-frequency questionnaire was used to collect the data in which food groups, dietary patterns obtained. There were 2778 cases of cholecystectomy. The result indicated that higher intake of legumes, fruits, vegetables and olive oil was linked with decreased risk of cholecystectomy in French women [16].

The purpose of current study was to explain that how preventive measures could be adopted to avoid the development of gallstones. So the burden of the disease may be cut down to improve the health of the people and also helps them in the reduction of financial burden.

METHODS

This was a cross-sectional study with the sample size of 100, conducted at Sir Ganga Ram Hospital, Lahore. 4 months from April to July 2017 was the duration of the study. Non probability convenient sampling technique is used. All patients from Sir Ganga Ram Hospital and Mayo Hospital, Lahore and both Indoor and outdoor patients were taken. All the adult's male and female patients of gallstones above 30 years old and both indoor and outdoor patients of medical, surgical units were

included. All non-corporative patients were excluded. The pre-tested questionnaire was used to collect data, while Microsoft excel and SPSS Version 21 was used to analyze the data.

RESULTS

A total 100 males and females were enrolled. Majority of males and females did not do indoor exercise that was 59%, 63% of males and females walk less than 30 minutes and 55% of males and females did not climb stairs and 72% males and females had sedentary lifestyle as shown in Table 1, Figure 1.

Physically active	Frequency
Did not do indoor exercise	59%
Walk less than 30 minutes	63%
Did not climb stairs	55%
Sedentary lifestyle	72%

Table 1: Frequency Distribution of physically active

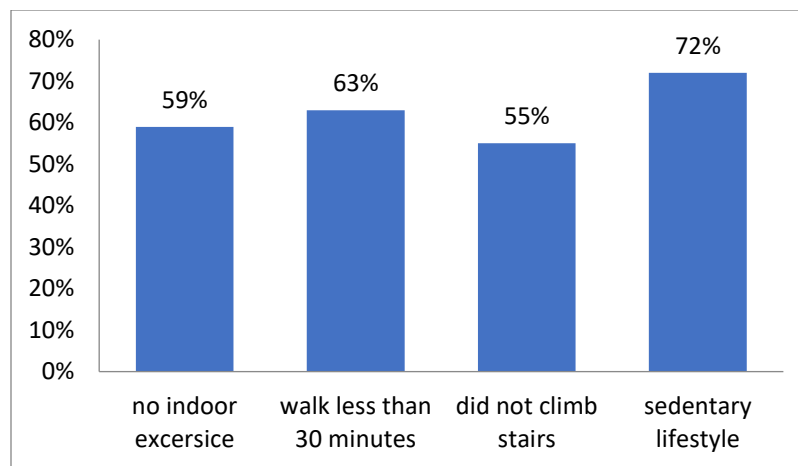


Figure 2: Frequency distribution of physically active

According to the results 56% males and females had more than 200mg/dl of cholesterol level, 70% males and females eat outside only on weekend and holidays, 91% males and females eat fatty food and 78% males and females eat junk food, 85% males and females eat 1 cup of sweets, 48% males and females take 1 piece of white bread and 95% males and females drinks 1 cup of whole milk as shown in Figure 2.

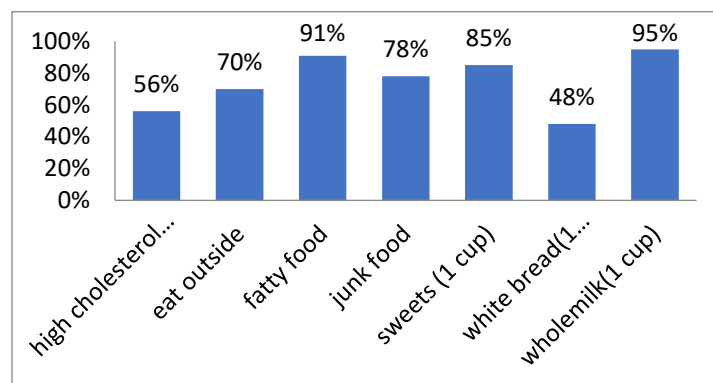


Figure 2: Frequency distribution of dietary habits

DISCUSSION

According to results 56% males and females had more than 200mg/dl of cholesterol level, which means that increased cholesterol might leads to gallstones, results were supported by the findings of Gu YC *et al.*, 2012 stated that total cholesterol, triglyceride, LDL cholesterol were positively linked with the occurrence of gallstone [9]. According to the current study majority of males and females did not do indoor exercise that was 59%, 63% of males and females walk less

than 30 minutes and 55% of males and females did not climb stairs while a study was conducted by Ansari-Moghaddam A *et al.*, 2015, according to their results people who done physical activity daily had less chances of having gallstones [10]. Current study revealed that 72% males and females had sedentary lifestyle while a study by Henao-Morán S *et al.*, 2014 the result indicated that recreational physical activity may protect against asymptomatic gallstones [11]. Findings of the current study stated that of 70% males and females eat outside only on weekend and holidays, 91% males and females eat fatty food and 78% males and females eat junk food while study was conducted by Channa NS *et al.*, 2013; stated that the prevalence of gallstones disease was higher in persons consumed fried foods and green chili than those who did not consume fried and junk foods [12]. Results of current study 85% males and females eat 1 cup of sweets, 48% males and females took 1 piece of white bread and 95% males and females drinks 1 cup of whole milk results were supported by findings of C-J Tsai *et al.*, 2005 stated that high intake of carbohydrates and glycemic index increases the risk of gallstones [13]. Some other studies have also reported the risk factors of gall stones, among which physical activity and diet are the main factors [14-18]. However a study suggested an inverse association between physical activity and incidence of gall stones [19]. It needs to be investigated cautiously through further studies. The studies exploring the association of nutrition in the gall bladder occurrence has also been observed [20,21]. It also needs to be further explored.

CONCLUSIONS

An association between increased cholesterol level and sedentary lifestyle has been observed with increasing incidence of the gallstones. Refined foods, junk foods and fried foods replaced healthy food which was the major cause of gallstones. Mostly population started using banas-patti ghee instead of oil as it was easy to purchase because of low cost, due to which obesity is increasing and chances of gallstone as well.

REFERENCES

- 1: L Kathleen Mahan, Sylvia Escott-Stump. Krause's food and nutrition therapy, 12 edition, Canada / Saunders Elsevier / 2008 / page no. 728. <https://www.worldcat.org/title/krauses-food-nutrition-therapy/oclc/191882186>
- 2: Manfred Schwab. Encyclopedia of Cancer, 3rd edition, Heidelberg, Germany /Springer/2011/page no.1493. doi.org/10.1007/978-3-662-46875-3
- 3: Gaby AR. Nutritional approaches to prevention and treatment of gallstones. *Alternative medicine review*. 2009 Sep 1; 14(3):258. <https://pubmed.ncbi.nlm.nih.gov/19803550/>
- 4: Sachdeva S, Khan Z, Ansari MA, Khalique N, Anees A. Lifestyle and gallstone disease: scope for primary prevention. *Indian journal of community medicine: official publication of Indian Association of Preventive & Social Medicine*. 2011 Oct; 36(4):263. doi.org/10.4103/0970-0218.91327
- 5: Shaffer EA. Epidemiology of gallbladder stone disease. *Best Practice & Research Clinical Gastroenterology*. 2006 Dec 31; 20(6):981-96. doi.org/10.1016/j.bpg.2006.05.004
- 6: Njeze G E (2013). Gallstones. *Nigerian Journal of Surgery : Official Publication of the Nigerian Surgical Research Society*, 19(2), 49-55. <http://doi.org/10.4103/1117-6806.119236>.
- 7: Acalovschi M. Cholesterol gallstones: from epidemiology to prevention. *Postgraduate medical journal*. 2001 Apr; 77(906):221. doi.org/10.1136/pmj.77.906.221
- 8: Lee JY, Keane MG, Pereira S. Diagnosis and treatment of gallstone disease. *The Practitioner*. 2015 Jun; 259(1783):15-9.
- 9: Gu YC, He XD, Yu JC, Kang WM, Tao LY, Wu Q. Metabolism-related risk factors of cholelithiasis among Beijing residents: a case-control study. *Zhongguo yi xue ke xue yuan xue bao. Acta Academiae Medicinae Sinicae*. 2012 Feb; 34(1):38-40.

- 10: Ansari-Moghaddam A, Khorram A, Miri-Bonjar M, Mohammadi M, Ansari H. The prevalence and risk factors of gallstone among adults in South-East of Iran: A population-based study. *Global journal of health science*. 2016 Apr; 8(4):60. doi.org/10.5539/gjhs.v8n4p60
- 11: Henao-Morán S, Denova Gutiérrez E, Morán S, Duque X, Gallegos Carrillo K, Macías N, Salmerón J. Recreational physical activity is inversely associated with asymptomatic gallstones in adult Mexican women. *Annals of hepatology*. 2014; 13(6):810. doi.org/10.1016/S1665-2681(19)30984-6
- 12: Channa NA, Khand F. Gallstones and their risk factors: an epidemiologic investigation in Southern Sindh, Pakistan. *Rawal Medical Journal*. 2013, Oct; 38(4).
- 13: Tsai CJ, Leitzmann MF, Willett WC, Giovannucci EL. Dietary carbohydrates and glycemic load and the incidence of symptomatic gall stone disease in men. *Gut*. 2005 Jun 1; 54(6):823-8. doi.org/10.1136/gut.2003.031435
- 14: Panpimanmas S, Manmee C. Risk factors for gallstone disease in a Thai population. *Journal of epidemiology*. 2009 May 5; 19(3):116-21. doi.org/10.2188/jea.JE20080019
- 15: Goktas SB, Manukyan M, Selimen D. Evaluation of Factors Affecting the Type of Gallstone. *Indian Journal of Surgery*. 2016 Feb 1; 78(1):20-6. doi.org/10.1007/s12262-015-1313-9
- 16: Barré A, Gusto G, Cadeau C, Carbonnel F, Boutron-Ruault MC. Diet and Risk of Cholecystectomy: A Prospective Study Based on the French E3N Cohort. *The American journal of gastroenterology*. 2017 Jul 25. doi.org/10.1038/ajg.2017.216
- 17: Shanmugam H, Molina Molina E, Di Palo DM, Faienza MF, Di Ciaula A, Garruti G, Wang DQH, Portincasa P. Physical Activity Modulating Lipid Metabolism in Gallbladder Diseases. *J Gastrointest Liver Dis*. 2020 Mar 13;29(1):99-110. doi: 10.15403/jgld-544. doi.org/10.15403/jgld-544
- 18: Aune D, Leitzmann M, Vatten LJ. Physical Activity and the Risk of Gallbladder Disease: A Systematic Review and Meta-Analysis of Cohort Studies. *J Phys Act Health*. 2016 Jul;13(7):788-95. doi: 10.1123/jpah.2015-0456. doi.org/10.1123/jpah.2015-0456
- 19: Zhang YP, Zhao YL, Sun YL, Zhu RT, Wang WJ, Li J. Physical Activity and the Risk of Gallstone Disease: A Systematic Review and Meta-analysis. *J Clin Gastroenterol*. 2017 Oct;51(9):857-868. doi: 10.1097/MCG.0000000000000571. doi.org/10.1097/MCG.0000000000000571
- 20: Martínez García RM, Jiménez Ortega AI, Salas-González M^aD, Bermejo López LM, Rodríguez-Rodríguez E. Intervención nutricional en el control de la colelitiasis y la litiasis renal [Nutritional intervention in the control of gallstones and renal lithiasis]. *Nutr Hosp*. 2019 Aug 27;36(Spec No3):70-74. Spanish. doi: 10.20960/nh.02813. doi.org/10.20960/nh.02813
- 21: Di Ciaula A, Garruti G, Frühbeck G, De Angelis M, de Bari O, Wang DQ, Lammert F, Portincasa P. The Role of Diet in the Pathogenesis of Cholesterol Gallstones. *Curr Med Chem*. 2019;26(19):3620-3638. doi: 10.2174/0929867324666170530080636. doi.org/10.2174/0929867324666170530080636