Vol. 5 No. 2 (2026)

Pakistan Journal of Medical & Cardiological Review

https://pakjmcr.com/index.php/1/about

Online ISSN 3007-2387

Print ISSN 3007-2379

Shameen et al., 2026

# PREVALENCE OF GALLSTONES IN PATIENTS UNDERGOING ABDOMINAL ULTRASOUND AT TERTIARY CARE HOSPITALS, DERA ISMAIL KHAN

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Received on 25 May, 2026

Accepted on 24 June, 2026

Published on 26 June, 2026

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**Abstract**

**Background**: Gallstone disease is a frequent hepatobiliary condition which may cause serious morbidity and often necessitates surgical treatment. The study was aimed to find the prevalence of gallstones among people attending abdominal ultrasound in tertiary hospitals of Dera Ismail Khan and to describe the distribution of gallstones among them by age and gender. **Method**: It was descriptive cross

sectional study of four months period, conducted at DHQ Hospital and Bio Med Center, Dera Ismail Khan. Patients were recruited by non-probability convenience sampling and a total of 245 patients, irrespective of gender, were recruited for abdominal ultrasound with the exclusion of patients with previous cholecystectomy. A self-administered questionnaire was used to gather the data on demographic characteristics, abdominal pain, and ultrasonographic findings (presence, number, location, and size of gallbladder) which was analyzed with SPSS version 22. **Results**: Of the 245 participants, 141 (57.6%) were female and 104 (42.4%) were male. 82 patients (33.5%) had gallstones and 163 (66.5%) did not have gallstones. 180 patients (73.5%) reported their abdominal pain. A large proportion of patients with gallstones (29.8% of all the patients) also had multiple stones (28.6% of all the patients) in the lumen of the gall bladder. Gallstone prevalence was highest for the age group 31 to 40 years, and 24.1% of the patients had an enlarged gall bladder. **Conclusion**: There were about 1/3 of patients in this cohort referred for abdominal ultrasound who had gallstones, and there was a higher prevalence in adults aged 31-50 years and females. These results contribute to the concept of targeted screening and early diagnosis in the at-risk population.

**Keywords:** Gallstones; Cholelithiasis; Abdominal Ultrasound; Prevalence; Gallbladder.

## INTRODUCTION

Gallstones, known as cholelithiasis, are one of the most prevalent disorders of the hepatobiliary system and a major public health issue worldwide, and are generally classified as cholesterol stones, black pigment stones and brown pigment stones that have different biochemical mechanisms.[2,3]

When left undiagnosed and untreated, gallstones can cause complications including acute cholecystitis, obstructive jaundice, pancreatitis, cholangitis and, very rarely, gallbladder carcinoma. The prevalence rates in Pakistan have varied between under 5% in African and Asian populations, and over 60% among some groups of American Indians with consistently higher rates in females, depending on the type of population and the geographic location of the study and the criteria used for the diagnosis of gallstones.[7–9]

Although these studies indicate a high disease burden, the epidemiological situation in the area is still limited. To plan resources, be able to detect early, and to implement targeted prevention strategies, the local prevalence and demographic pattern of gallstone disease must be established. This study was therefore designed to find out the prevalence of gall stones and its distribution according to gender and age in the patients attending abdominal ultrasound at tertiary care hospitals in Dera Ismail Khan.

## MATERIALS AND METHODS

The descriptive, cross sectional study was carried out at DHQ Hospital and Bio Med Center, Dera Ismail Khan during a four months period (March to June). Ethical clearance and No Objection Certificates were secured from the Department of Medical Imaging of Faculty of Allied Health Sciences, Gomal University, Dera Ismail Khan, before starting data collection, following the Declaration of Helsinki. All participants gave informed written consent and confidentiality was ensured throughout the study.

The sample size of 245 was determined with a WHO sample size calculator using a prevalence of 12.4%, a margin of error of 5%, and a 95% confidence level. Eligible subjects were all patients referred to the radiology department for abdominal ultrasound regardless of their age and gender, and patients with a previous history of cholecystectomy were excluded. Non-probability convenience sampling technique was used to enroll the participants.

The following data was obtained from a self-administered structured questionnaire: Demographic data (age, gender, marital status) and ultrasonographic data (abdominal pain, presence and number of gallstones, presence of a gallstone in the lumen, neck or common bile duct of the gallbladder, and size (normal/large). Highly qualified radiology personnel at the respective centers reported all ultrasound examinations.

The data analysis was done using SPSS 22.0 version. Categorical variables (gender, age group, marital status, abdominal pain, presence of gallstone, location of the gallstone and stone category, gallbladder size) were tabulated as frequencies and percentages and cross tabulated against gender, marital status and age group. Results are tabulated.

## RESULTS

There were 245 patients who were undergoing abdominal ultrasound and were included in the study. Of these, 141 (57.6%) were female and 104 (42.4%) were male. Regarding marital status, 184 (75.1%) were married, 40 (16.3%) were unmarried and 21 (8.6%) were children. Participants were distributed across age groups as follows: 0–10 years, 21 (8.6%); 11–20 years, 39 (15.9%); 21–30 years, 30 (12.2%); 31–40 years, 58 (23.7%); 41–50 years, 36 (14.7%); 51–60 years, 34 (13.9%); and over 60 years, 27 (11.0%) (Table 1).

80 (73.5%) reported abdominal pain, 65 (26.5%) were asymptomatic. Ultrasound confirmed gallstones in 82 patients (33.5%) while no gallstones were found in 163 patients (66.5%) (Table 2). Of the patients who had gallstones, 73 (29.8%) had a number of stones and 9 (3.7%) had one gallstone. In terms of location, 70 patients (28.6%) had stones in the gallbladder lumen, 9 (3.7%) had stones in the neck and 3 (1.2%) had stones

in the common bile duct. Gallbladder size was enlarged in 59 patients (24.1%) and normal in 186 (75.9%).

On cross-tabulation by gender, gallstones were detected in 50 of 141 females (35.5%) and 32 of 104 males (30.8%) (Table 3). Abdominal pain was more frequent among females (99/141, 70.2%) than males (81/104, 77.9%). When stratified by age, gallstone frequency was highest in the 31–40-year group (39/58, 67.2%), followed by the 41–50-year group (20/36, 55.6%), while prevalence was markedly lower in participants aged 60 years and above (4/27, 14.8%) and those aged 21–30 years (1/30, 3.3%) (Table 4).

Table 1: *Demographic Distribution of Study Participants (N = 245)*

| Variable | Frequency (n) | Percentage (%) |
|---|---|---|
| **Gender** | | |
| Female | 141 | 57.6 |
| Male | 104 | 42.4 |
| **Marital Status** | | |
| Married | 184 | 75.1 |
| Unmarried | 40 | 16.3 |
| Child | 21 | 8.6 |
| **Age Group (years)** | | |
| 0–10 | 21 | 8.6 |
| 11–20 | 39 | 15.9 |
| 21–30 | 30 | 12.2 |
| 31–40 | 58 | 23.7 |
| 41–50 | 36 | 14.7 |
| 51–60 | 34 | 13.9 |
| >60 | 27 | 11.0 |

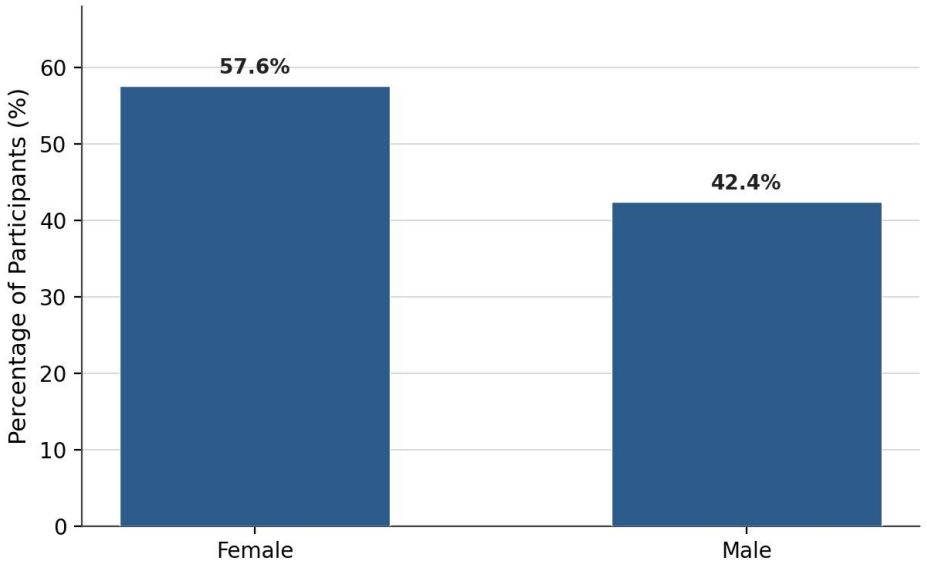


*Figure 1: Gender Distribution of Study Participants (N = 245)*

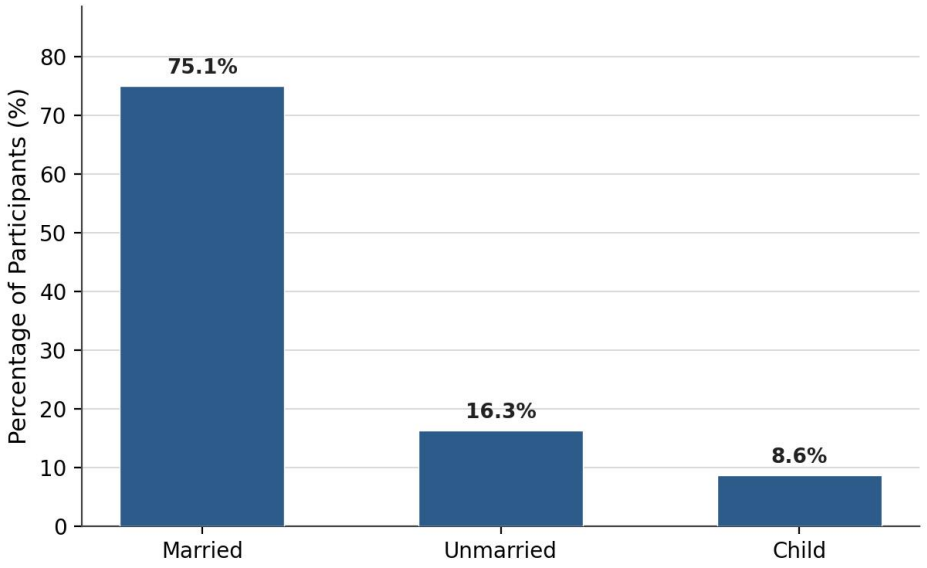


*Figure 2: Marital Status Distribution of Study Participants (N = 245)*

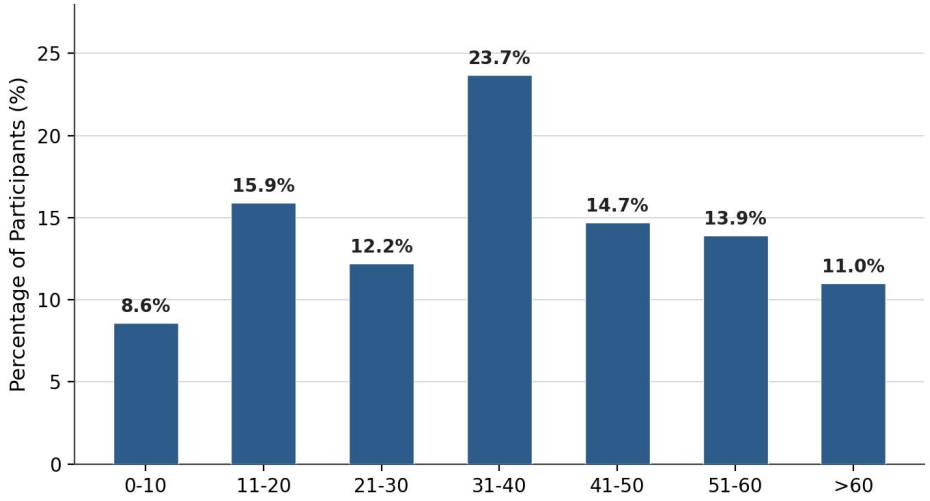


*Figure 3: Age Distribution of Study Participants (N = 245)*

Table 2: *Ultrasonographic Findings (N = 245)*

| Variable | Frequency (n) | Percentage (%) |
|---|---|---|
| **Abdominal Pain** | | |
| Yes | 180 | 73.5 |
| No | 65 | 26.5 |
| **Gallstone Present** | | |
| Yes | 82 | 33.5 |
| No | 163 | 66.5 |
| **Stone Category** | | |
| Multiple | 73 | 29.8 |
| Single | 9 | 3.7 |
| None | 163 | 66.5 |
| **Stone Location** | | |
| Gallbladder Lumen | 70 | 28.6 |
| Neck | 9 | 3.7 |
| Common Bile Duct | 3 | 1.2 |
| None | 163 | 66.5 |

| | | |
|---|---|---|
| **Gallbladder Size** | | |
| Normal | 186 | 75.9 |
| Enlarged | 59 | 24.1 |

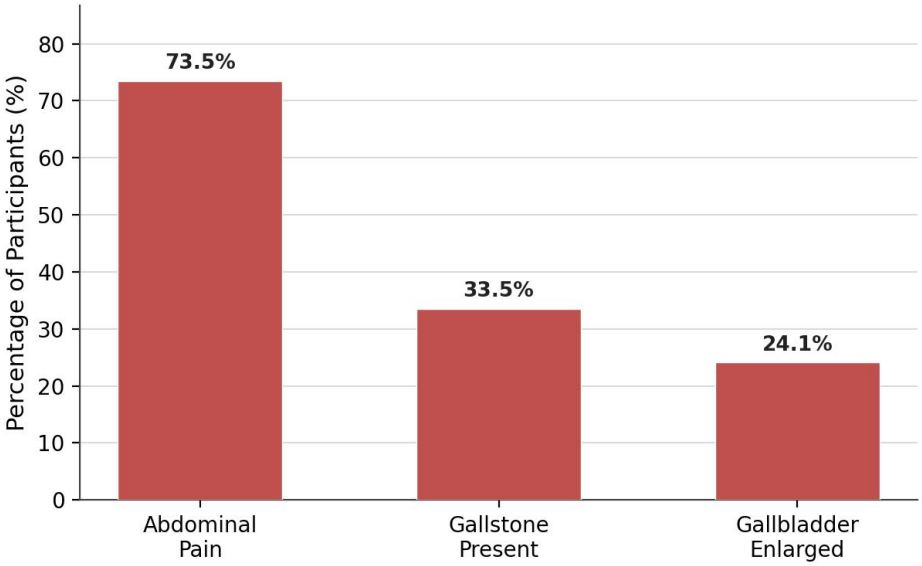


*Figure 4: Frequency of Key Ultrasonographic Findings (N = 245)*

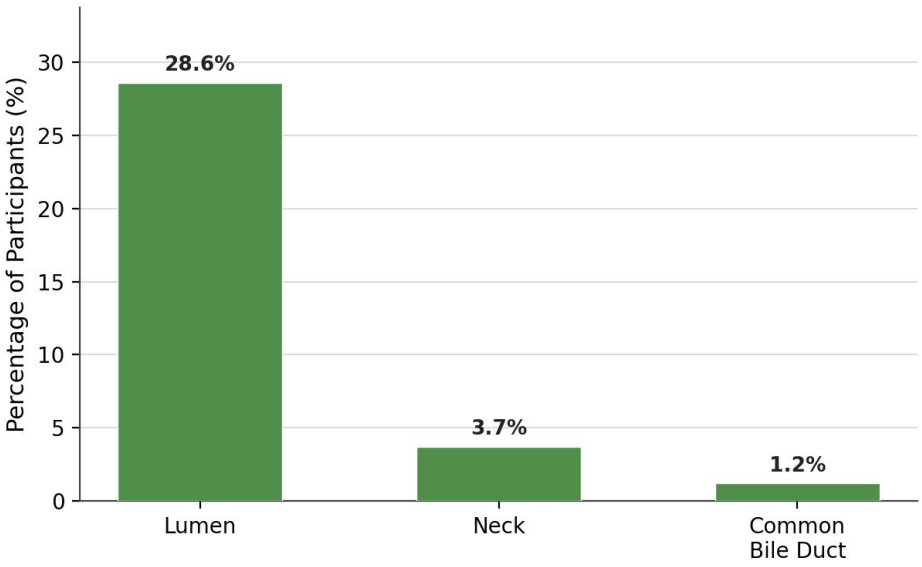


*Figure 5: Anatomical Location of Gallstones (N = 245)*

Table 3: *Gallstone Presence and Abdominal Pain by Gender*

| Gender | Gallstone – Yes n (%) | Abdominal Pain – Yes n (%) | Total (n) |
|---|---|---|---|
| Female | 50 (35.5) | 99 (70.2) | 141 |
| Male | 32 (30.8) | 81 (77.9) | 104 |
| **Total** | **82 (33.5)** | **180 (73.5)** | **245** |

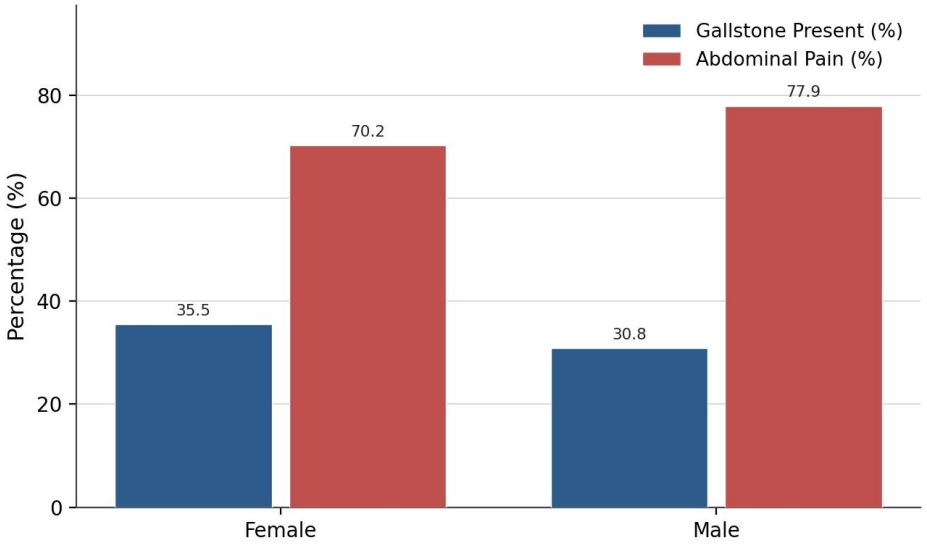


*Figure 6: Gallstone Presence and Abdominal Pain by Gender*

Table 4: *Gallstone Frequency by Age Group*

| Age Group (years) | Gallstone – Yes n (%) | Total (n) |
|---|---|---|
| 0–10 | 6 (28.6) | 21 |
| 11–20 | 6 (15.4) | 39 |
| 21–30 | 1 (3.3) | 30 |
| 31–40 | 39 (67.2) | 58 |
| 41–50 | 20 (55.6) | 36 |
| 51–60 | 6 (17.6) | 34 |
| >60 | 4 (14.8) | 27 |
| **Total** | **82 (33.5)** | **245** |

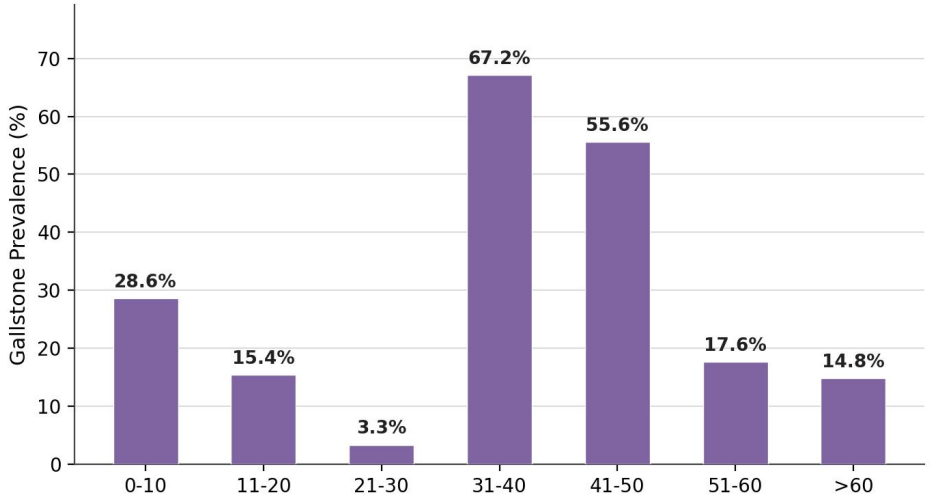


*Figure 7: Gallstone Frequency by Age Group*

## DISCUSSION

The prevalence of gallstones in this study was 33.5% in patients undergoing abdominal ultrasound in the tertiary care hospitals at Dera Ismail Khan, with more in female patients (35.5%) than male patients (30.8%). This rate is close to that found in other hospital based series of South Asians conducted, but is lower than the rates reported from some referral populations with suspected biliary disease, being influenced by differences in the setting of the study, sampling strategy and underlying population risk profile.

A study from Karachi reported a significantly higher proportion of female gender among the individuals diagnosed with gallstones (73.6%) and most of the patients had multiple stones (87%) rather than single stones, which is similar to the findings of the present study.[10] The overall prevalence of gallstones in the present study was comparatively lower as it included consecutive ultrasound referrals, whereas in Gujranwala, the data was obtained from the hospital, which may be explained by the difference in referral patterns.

In the present study, 73.5% of the participants reported abdominal pain. In contrast to a case-control study that showed significant multivariate association of abdominal discomfort and intolerance of fatty foods with gallstones, our cohort also had a high prevalence of abdominal discomfort in both stone-positive and stone-negative patients, indicating that pain is not a good discriminator for gallstones in a general ultrasound referral population, and emphasizing the importance of ultrasonography in making the final diagnosis.

The age distribution and predominance of stones in the lumen of the gallbladder is consistent with the other hospital-based studies from the region, and suggests that dietary differences, genetic susceptibility and metabolic risk factors may differ between populations.

There are several limitations of this study. The design of the cross section does not allow for a causal interpretation, and the use of ultrasonography alone may have underestimated the incidence of stones of very small size or stones in the bile ducts that are less visible on ultrasonography. There was also limited generalizability as the non-probability convenience sampling of two centers was used.

## CONCLUSION

Gallstones were observed in about 1/3 of the patients who underwent abdominal ultrasound in tertiary hospitals in Dera Ismail Khan, and were most commonly seen in adults aged 31-50 years and there was a slight excess in females. The majority of the patients had several stones in the lumen of gall bladder. This is indicative of a significant burden of gallstone disease in the local population and provides justification for targeted screening, awareness creation and early diagnostic referral for vulnerable populations such as middle-aged adults. It is recommended that larger multicenter studies with probability-based sampling are done to confirm these findings and to differentiate region-specific risk factors.

Based on the results from this study the following recommendations are made:

- Considering the high prevalence of gallstones in high-risk groups, adults aged 31-50 years and women in particular, abdominal ultrasound screening should be routine.
- Public awareness programmes should be started at the primary care level to advise patients of risk factors of the gallstone disease, early symptoms and complications and prompt the presentation to the healthcare provider for diagnosis.
- Guidelines for the management of asymptomatic gallstones identified in an ultrasound should be standardized and shared with the radiologist and primary care providers in tertiary care hospitals across the region.
- Future studies should use probability sampling at several centers to confirm the present results, and to study the prevalence of factors that may be specific to the area and include dietary habits, obesity and parity.
- Healthcare professionals such as radiologists, general physicians and surgeons should work together on referral pathways which enable patients with symptomatic or complicated gallstones to have timely surgical evaluation.

## STRENGTHS AND LIMITATIONS

### Strengths

There are several strengths in this study. Second, it offers an initial estimate of the prevalence of gallstones among the local population of those having an abdominal ultrasound, which has not previously been available from the region. Secondly, the sample size was calculated to be reasonably large (n = 245) and was calculated with the use of a known statistical formula.Secondly, the prevalence estimates are reasonably precise because the sample size (n = 245) was calculated using a recognised formula for calculating sample size. Third, data was gathered prospectively by using a structured questionnaire and standardized ultrasonographic criteria, thus reducing recall bias and standardizing the criteria for defining a case among the participants. Last, demographic and clinical factors (age, gender, marital status, abdominal pain, number of stones, stone location and gallbladder size) enabled a multidimensional description of the disease pattern in this population.

### Limitations

The results should be interpreted in light of the following caveats. Since the cross sectional design makes it impossible to determine temporal and/or causal relationships between risk factors and gallstone disease, the findings cannot be interpreted as such. The findings of this study may not be generalizable to the larger population of Dera Ismail Khan and its surrounding area because non-probability convenience sampling was used at just two centers. The use of ultrasonography alone, though very sensitive, has underestimated the actual prevalence of very small stones or stones in the distal common bile duct, which are sonographically less conspicuous. Further, some potential confounding factors influencing gallstone risk were not collected, including BMI, dietary intake, parity, and comorbidities (diabetes). In addition, a 4-month study period may have been too short to capture any seasonal variation in patient referrals.

## AUTHOR CONTRIBUTIONS

**Aliza Shameen:** Conceptualization, methodology, data collection, investigation, literature review, and manuscript drafting.

**Asad Ullah:** Data acquisition, data curation, statistical analysis, validation, and manuscript review.

**Nida Lohani:** Literature search, data collection, investigation, data interpretation, and manuscript editing.

**Aman Ullah:** Supervision, study design, methodology development, critical review, and final approval of the manuscript.

**Faiz Ullah:** Data collection, data management, formal analysis, and manuscript preparation.

**Muhammad Umair:** Investigation, data curation, visualization, interpretation of findings, and manuscript review.

**Fiza Dilshaad:** Literature review, data collection, validation, proofreading, and manuscript editing.

**Sharifullah (Corresponding Author):** Conceptualization, supervision, project administration, methodology, formal analysis, manuscript review and editing, correspondence handling, and final approval of the manuscript.

**All authors** contributed to the study, reviewed the manuscript critically for important intellectual content, approved the final version, and agreed to be accountable for all aspects of the work.

## REFERENCES

1. Portincasa P, Moschetta A, Palasciano G. Cholesterol gallstone disease. Lancet. 2006;368(9531):230–239.
2. Bazzocchi M, Zuiani C, Rigamonti A, Quaia E. Ultrasonography of the gallbladder. In: Ultrasound of the Gastrointestinal Tract. Berlin: Springer; 1997. p. 39–51.
3. Iqbal MN, Iqbal MA, Javaid R, Abbas MW. Gall stones: a fundamental clinical review. Int J Res Med Sci. 2019;7(7):2869.
4. Saleem MN. Sonographic evaluation of causes of right hypochondriac pain. J Health Med Nurs. 2021:38–46.
5. Dar AN, Liaqat M, Farooq SMY, Fatima M. Sonographic association of cholelithiasis with obstructive jaundice in adult patients. J Health Med Nurs. 2020.
6. Bhatti A, Waqar A, Zia S, Hussain N, Zulfiqar T. A cross sectional study on the risk factors of gallbladder stone. Int J Res Med Sci. 2016;4(11):5041–5046.
7. Aslam HM, et al. Assessment of gallstone predictor: comparative analysis of ultrasonographic and biochemical parameters. Int Arch Med. 2013;6(1):1–7.
8. Al-Obaidi SMM. The prevalence of silent gallstones and its relation to some risk factors in Iraq. Iraqi Acad Sci J. 2006;5(2):146–150.
9. Nasir A, Zulfiqar T, Ali A, Zafar H. Prevalence of gallstone disease and its correlation with age among people undergoing abdominal ultrasound in Gujranwala. EAS J Radiol Imaging Technol. 2021;3(3):142–145.
10. Memon J, Soomro SA, Jarwar M, Laghari MH, Laghari AA. Incidence of cholelithiasis, its complications and management at Isra University Hospital. Pak J Med Health Sci. 2020;14(3):1783–1785.

11. Dhamnetiya D, Goel M, Dhiman B, Pathania O. Clinical presentation of gallstone disease: evidence from a case-control study. Arch Int Surg. 2019;9(1):1.
12. Gyedu A, Adae-Aboagye K, Badu-Peprah A. Prevalence of cholelithiasis among persons undergoing abdominal ultrasound at the Komfo Anokye Teaching Hospital, Kumasi, Ghana. Afr Health Sci. 2015;15(1):246–252.