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"Prevalence, Etiology & Consequences Of Cholelithiasis Among Male Patients At District Abbottabad, Kp, Pakistan"

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Article Details

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ABSTRACT

The gallbladder stones, also known as cholelithiasis, are a common medical condition that affects individuals worldwide. Gallbladder stones forms when substances within the bile, such as cholesterol, bile salts, and calcium, crystallize and solidify into particles. These stones can range in size from tiny grains to larger stones that may obstruct the bile ducts. This study aimed to investigate the prevalence, etiology, and consequences of gallbladder stones among patients in District Abbottabad, Khyber Pakhtunkhwa, Pakistan. A cross-sectional design was employed, and data was collected through a questionnaire survey and personal interviews from a sample of 150 male respondents, including 50 doctors and 100 patients. The study found that the majority of respondents were in the age group of 41 to 45 years. Three size categories of gallbladder stones were identified: small, moderate, and large. Most patients had smaller-sized stones. Obesity, high cholesterol levels, family history, rapid weight loss, and certain medications were reported as causes of gallbladder stones. Ultrasound was the most commonly used diagnostic method, followed by CT scans, X-rays, and blood tests. The most frequently recommended treatment option was gallbladder removal surgery (cholecystectomy), followed by lifestyle changes and medication. The study revealed that patients primarily sought treatment through surgery, with medications being less commonly recommended. Monthly hospital visits were the most prevalent pattern for examination of gallbladder stones. The study provides valuable insights into the prevalence, risk factors, diagnostic methods, treatment options, and patient behaviors regarding gallbladder stones in District Abbottabad, Khyber Pakhtunkhwa, Pakistan.

INTRODUCTION

Gallstones, also known as cholelithiasis, are a widespread medical issue that affects individuals across the world (Ahmed et al., 2017). Gallbladder stones are formed as a result of the complex interaction of numerous chemicals within the bile (Aziz et al., 2015). Cholesterol gallstones are the most common type and form when there is an imbalance between cholesterol secretion, bile salt concentration, and the gallbladder's ability to empty properly (Anveden et al., 2020).Pigment gallstones, less common but often associated with certain medical conditions, form when there is an excess of bilirubin in the bile. Other types of stones, such as mixed stones, can also occur, combining components of cholesterol and pigments (Aziz et al., 2015). The gallbladder is a small, pear-shaped organ situated beneath the liver. Its primary function is to store bile, a digestive fluid produced by the liver, and releases it into the small intestine to aid in the digestion and absorption of fats. Gallbladder stones form when substances within the bile, such as cholesterol, bile salts, and calcium, crystallize and solidify into particles. Gall bladder stones (cholelithiasis) are a common health issue worldwide (Chilimuri et al., 2016).

The prevalence of gallbladder stones varies among different populations and regions. These stones can range in size from tiny grains to larger stones that may obstruct the bile ducts (Chowbey et al., 2015).

The symptoms of gallbladder stones can vary in severity, ranging from mild discomfort to acute complications (Aziz et al., 2015). Externally, individuals with gallbladder stones often experience pain in the upper right side of the abdomen, which can radiate to the back or shoulder (Dutta et al., 2019). This pain, known as biliary colic, is typically caused by the contraction of the gallbladder in response to the presence of stones (Grigor'eva, 2020). It is usually triggered by the consumption of fatty or greasy foods. The pain can be intermittent or persistent and may last anywhere from a few minutes to several hours. Internally, gallbladder stones can lead to various complications. One common complication is inflammation of the gallbladder, known as cholecystitis. When a stone blocks the gallbladder's outlet or cystic duct, it can cause the gallbladder to become inflamed (Grigor'eva, 2020). This can result in severe abdominal pain, tenderness, fever, and sometimes even an infection. If left untreated, cholesystitis can lead to more serious complications such as the formation of abscesses or perforation of the gallbladder (Koshiol et al., 2017).

Another potential complication of gallbladder stones is the obstruction or infection of the common bile duct, a condition called choledocholithiasis. When a stone becomes lodged in the bile duct, it can cause blockage and impair the flow of bile from the liver to the intestines. This can lead to jaundice, a yellowing of the skin and eyes, along with dark urine and pale stools. Choledocholithiasis can also cause inflammation and infection of the bile duct, known as cholangitis, which can be a life-threatening condition if not promptly treated (Kummen et al., 2017). In some cases, gallbladder stones can result in gallstone pancreatitis, which occurs when a stone obstructs the pancreatic duct. This can cause inflammation of the pancreas, leading to severe abdominal pain, nausea, vomiting, and potentially life-threatening complications (Koshiol et al., 2017). Gallstone pancreatitis requires immediate medical attention and hospitalization. It is essential for individuals experiencing symptoms suggestive of gallbladder stones, such as upper abdominal pain, to seek medical evaluation for proper diagnosis and management. Prompt identification and treatment of gallbladder stones can help alleviate symptoms, prevent complications, and improve the overall well-being of affected individuals (Kummen et al., 2017).

The formation of gallbladder stones, or cholelithiasis, is a multifactorial process influenced by a combination of genetic and environmental factors. One significant risk factor for gallbladder stone formation is obesity. Excess body weight and obesity are associated with increased cholesterol secretion in bile, reduced gallbladder motility, and alterations in the composition of bile salts (Laleman et al., 2017). These changes contribute to the formation of cholesterol stones, which are the most common type of gallbladder stones. A sedentary lifestyle is another factor that can contribute to the development of gallbladder stones. Lack of physical activity can lead to decreased gallbladder motility, impairing the emptying of bile and promoting stasis (Portincasa et al., 2016). This can facilitate the precipitation of bile constituents, including cholesterol, and the formation of gallstones. Dietary factors play a crucial role in gallstone formation. A high-fat diet, particularly one rich in saturated fats and cholesterol, increases the risk of developing gallbladder stones (Rawla et al., 2019). Consuming excess dietary cholesterol can lead to its super saturation in the bile, promoting stone formation. Rapid weight loss, especially through crash diets or extreme calorie restriction, can also increase the risk of gallbladder stone formation (Laleman et al., 2017).

This is because rapid weight loss can disrupt the balance of bile salts and cholesterol in the gallbladder, predisposing to stone formation (Rebholz et al., 2018). Several medications are known to contribute gallstone formation, for instance, estrogen-based hormonal therapies, such as oral contraceptives and hormone replacement therapy, can increase the risk of gallbladder stone formation, particularly in women. Additionally, certain medications used for lowering cholesterol levels, such as fibrates, can alter the composition of bile and increase the risk of gallstone formation. Genetic factors also play a role in gallbladder stone formation (Rebholz et al., 2018). Individuals with a family history of gallstones are more likely to develop the condition themselves, suggesting a genetic predisposition. Specific genetic variations can influence the metabolism of cholesterol and bile acids, making some individuals more susceptible to gallstone formation (Schmidt et al., 2019). Understanding the etiological factors associated with gallbladder stone development is crucial for implementing preventive measures and interventions. Encouraging a healthy lifestyle that includes regular physical activity and a balanced diet low in saturated fats and cholesterol can help reduce the risk of gallstone formation (Shabanzadeh, 2018). For individuals with known risk factors, such as obesity or a family history of gallstones, targeted interventions may include weight management programs, dietary counseling, and hormonal therapies tailored to minimize the risk of stone formation (Schmidt et al., 2019).

The presence of stones can lead to acute inflammation of the gallbladder, resulting in severe pain and discomfort. Infection of the common bile duct can occur when a stone obstructs the flow of bile, leading to cholangitis, which presents with symptoms of fever, jaundice, and abdominal pain. Obstruction of the bile ducts can also cause bile to back up into the liver, leading to liver damage. The presence of stones can cause recurrent episodes of biliary colic, leading to chronic pain and discomfort (Shabanzadeh, 2018).

The obstruction of bile ducts can disrupt the normal flow of bile, impairing the digestion and absorption of fats and fat-soluble vitamins. The consumption of a diet rich in saturated fats and cholesterol contributes to the increased production of cholesterol in the liver, which can lead to the formation of gallstones. The topic of gallbladder stones holds significant importance in the healthcare landscape of Khyber Pakhtunkhwa, Pakistan. Understanding the prevalence, etiology, and consequences of this condition is crucial for healthcare professionals in effectively managing and preventing gallbladder stone-related complications (Zhang et al., 2022). The topic of gallbladder stones holds significant importance in the

healthcare landscape of Khyber Pakhtunkhwa, Pakistan. Understanding the prevalence, etiology, and consequences of this condition is crucial for healthcare professionals in effectively managing and preventing gallbladder stone-related complications (Zhang et al., 2022).

Therefore the current study were aimed to estimate the prevalence and demographic distribution of gallbladder stones, risk factors and etiological factors associated with the development of gallbladder stones and its consequences and impact on patients at District Abbottabad, KP, Pakistan.

1. MATERIALS AND METHODS

2.1 Study Design

This study employed a cross-sectional design to investigate the prevalence, etiology, and consequences of gallbladder stones among patients in District Abbottabad, Khyber Pakhtunkhwa (KPK), Pakistan. The primary data collected through questionnaire and personal interview were used for data collection. A total of 150 respondents participates in this study. All the respondents participate in study were male's patients.

2.2 Study Setting

The study was conducted in District Abbottabad, KPK, Pakistan. District Abbottabad is located in the northern region of Pakistan and is known for its diverse population and high prevalence of gallbladder stone cases.

2.3 Sample Size and Selection

The sample size was determined using a formula based on the expected prevalence of gallbladder stones in the region, the desired level of precision, and the estimated non-response rate. A total of 150 patients were selected through systematic random sampling from different healthcare facilities in District Abbottabad..

2.4 Data Collection

2.4.1 Questionnaire Development: A structured questionnaire was developed to collect data from the participants. The questionnaire consisted of sections covering demographic information, medical history, lifestyle factors, dietary habits, and symptoms related to gallbladder stones (Annexes-I).

2.4.2 Personal interviews: The direct interviews from the patients suffering from gallbladder stones. The interview also contains same information i.e., demographic information, medical history, lifestyle factors, dietary habits, and symptoms related to gallbladder stones (Annexes-I).

2.5 Data Collection Procedure:

The data was collected through personnel visited the selected healthcare facilities and approached potential participants. Informed consent was obtained from each participant before administering the questionnaire. The participants were interviewed face-to-face, and their responses were recorded in the questionnaire.

2.6 Clinical Examination and Investigations

The clinical information of the patients was also collected through questionnaire and examination of secondary reports of the patients such as abdominal ultrasound, liver function tests, and lipid profile.

2.7 Data Analysis

The collected data were entered into a computerized database using appropriate software (e.g., SPSS, Excel). Descriptive statistics were used to summarize the demographic characteristics of the participants, as well as the prevalence of gallbladder stones. The chi-square test or

Fisher's exact test was employed to explore the association between potential risk factors and the development of gallbladder stones. Logistic regression analysis was conducted to identify independent risk factors. The consequences and impact of gallbladder stones were assessed through qualitative analysis of the participants' responses.

2.8 Ethical Considerations

Ethical approval for the study was obtained from the Research Ethics Committee of University. Informed consent was obtained from all participants, and their privacy and confidentiality were maintained throughout the study.

2.9 Limitations

The study had several limitations. The cross-sectional design limited the establishment of causal relationships between risk factors and gallbladder stones. The study was conducted in a specific district of Khyber Pakhtunkhwa, which may limit the generalizability of the findings to other regions in Pakistan. Similarly, the data of only male patients were collected in this study.

2. RESULTS AND DISCUSSION

a. Demographic Information

This study was conducted to estimate the prevalence, demographic distribution, risk factors, etiological factors associated with the development of gallbladder stones in patients, consequences and impact of gallbladder stones on patients in District Abbottabad, KPK, and Pakistan. In this study data was collected through questionnaire survey and interviews. The targeted population for data collection includes the doctors / physicians (health experts) and patients suffering from gallbladder stones. A total of 150 respondents including 50 doctors / physicians (health experts) and 100 patients were interviewed for data collection. Only the male patients were selected interviewed for data collection in this study. The respondents of different age (30 to 74 years) group participate in the study and majority were belongs from age group 41 to 45 years (Figure 3.1).

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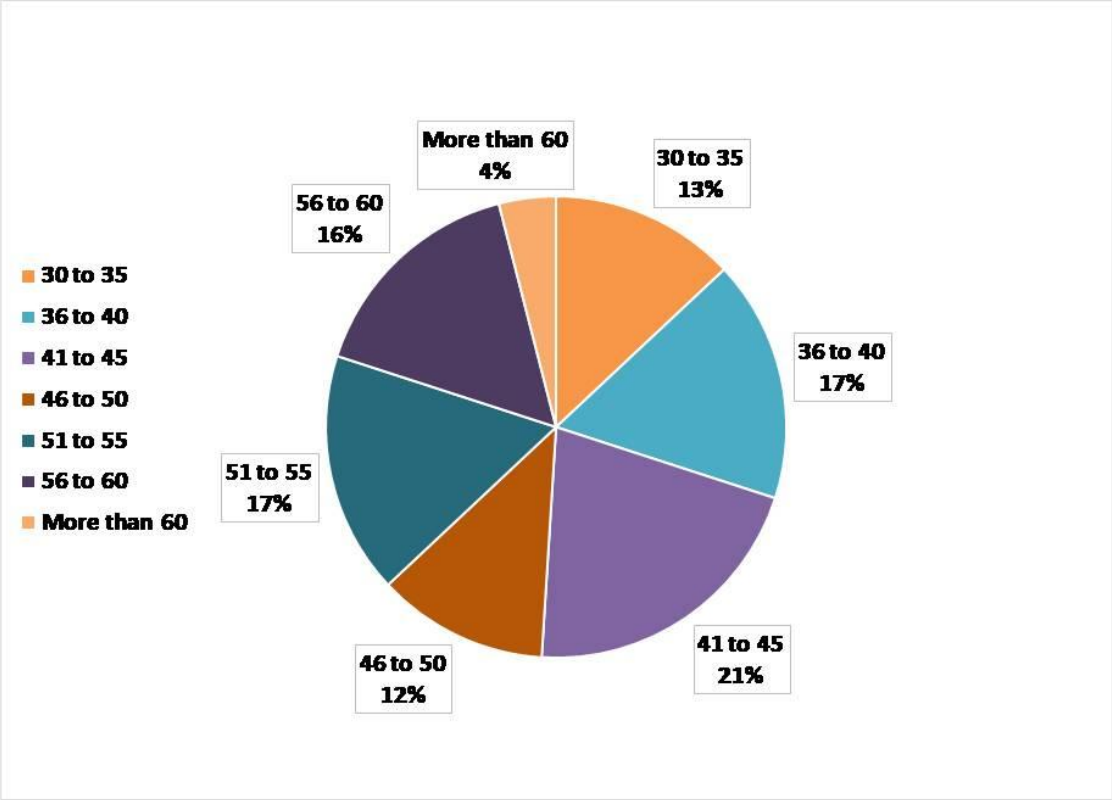

Figure 3.1 Agewise data distribution of the patients having gallstone.

3.2 Size of Gallbladder Stones

This study reports different sizes of gallbladder stones. According to the data there are three different size categories for stones: Size 1, Size 2, and Size 3. The sizes are determined based on the diameter of the stones. The size 1: small stones (<5 mm): This category includes stones that have a diameter of less than 5 millimeters. These stones are considered to be small in size. Size 2: moderate stones (5-10 mm): This category includes stones that have a diameter ranging from 5 to 10 millimeters. These stones are of a moderate size, falling between small and large stones. Size 3: Large stones (>10 mm): This category includes stones that have a diameter greater than 10 millimeters. These stones are considered to be large in size. The most of the respondents have smaller sized stone 60% followed by moderate size gallbladder stone 28% and smallest number of respondents 12% has larger sized gallbladder stone (Figure 3.2).

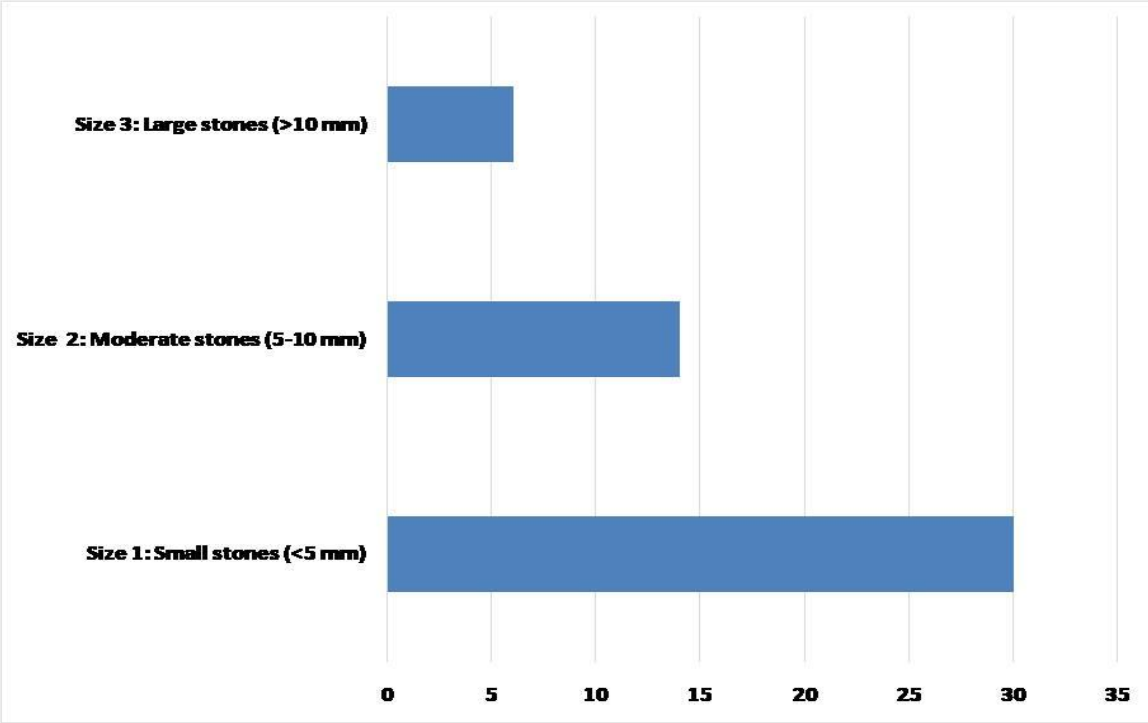

Figure 3.2 Size of the gallbladder stone diagnosed in the patients of the study area.

b. Causes of Gallbladder Stones

There are several causes of gallbladder stones reported in this study. i.e., Obesity: a total of 17 occurrences. The Obesity refers to excessive body weight, and it has been identified as a potential cause of gallbladder stones. People who are overweight or obese have a higher risk of developing gallstones. High cholesterol levels: 13 occurrences. The high levels of cholesterol in the body can contribute to the formation of gallbladder stones. When there is an imbalance in the bile components, such as an excess of cholesterol, it can lead to the formation of gallstones. Family history: 11 occurrences. The family history plays a role in the development of gallbladder stones. If there is a family history of gallstones, individuals may have a higher risk of developing them as well. Rapid weight loss: 5 occurrences. The rapid or sudden weight loss can increase the risk of gallbladder stone formation. When the body goes through significant weight loss in a short period, it can disrupt the balance of bile salts and cholesterol, leading to the formation of stones. Certain medications: 4 occurrences. Some medications have been associated with an increased risk of gallbladder stone formation. The certain drugs can affect the composition of bile or increase cholesterol levels, contributing to stone formation (Figure 3.3). The diet, life style, family history and drugs have direct impact on gallbladder stone formation (Friedman, 2016).

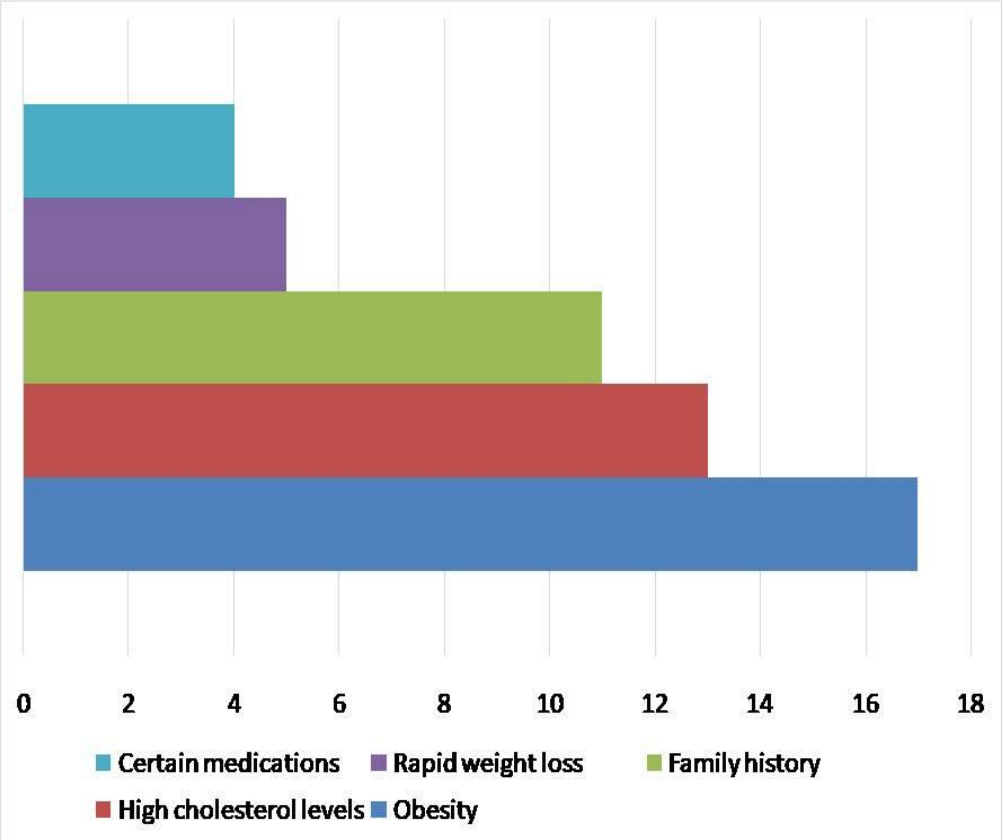

Figure 3.3 Causes of formation of gallbladder stone

c. Diagnostic tools for Gallbladder Stones

This study provided different methods of diagnosing gallbladder stones in the study area. i.e., Ultrasound: This method involves using sound waves to create images of the gallbladder and is commonly used for diagnosing gallbladder stones. In the given study, the frequency for ultrasound is 45, indicating that it is the most frequently used diagnostic method for gallbladder stones. CT scan: CT stands for computed tomography, which uses X-rays and computer technology to produce detailed cross-sectional images of the body. In this context, it is used to examine the gallbladder for the presence of stones. The frequency for CT scan in the study is 3, suggesting that it is the second most frequently used diagnostic method. X-rays: X-rays are a type of electromagnetic radiation used to produce images of the internal structures of the body (Cotton et al., 2016). In the case of gallbladder stones, X-rays can help detect the presence of calcified stones. The frequency for X-rays in the study indicating that it is the third most frequently used diagnostic method. Blood tests: Blood tests are not a direct method for diagnosing gallbladder stones, but they can provide useful information about the functioning of the gallbladder and liver (Cotton et al., 2016). Certain blood markers, such as liver enzymes and bilirubin levels, may be elevated in the presence of gallbladder stones. The frequency for blood tests in the study, suggesting that it is the least frequently used diagnostic method among the four listed (Figure 3.4). Based on the findings of this study, the major cause of diagnosing gallbladder stones appears to be ultrasound, followed by CT scan, X-rays, and finally blood tests. Ultrasound is the most commonly utilized method, indicating its

effectiveness and widespread availability for diagnosing gallbladder stones (Chen et al., 2016).

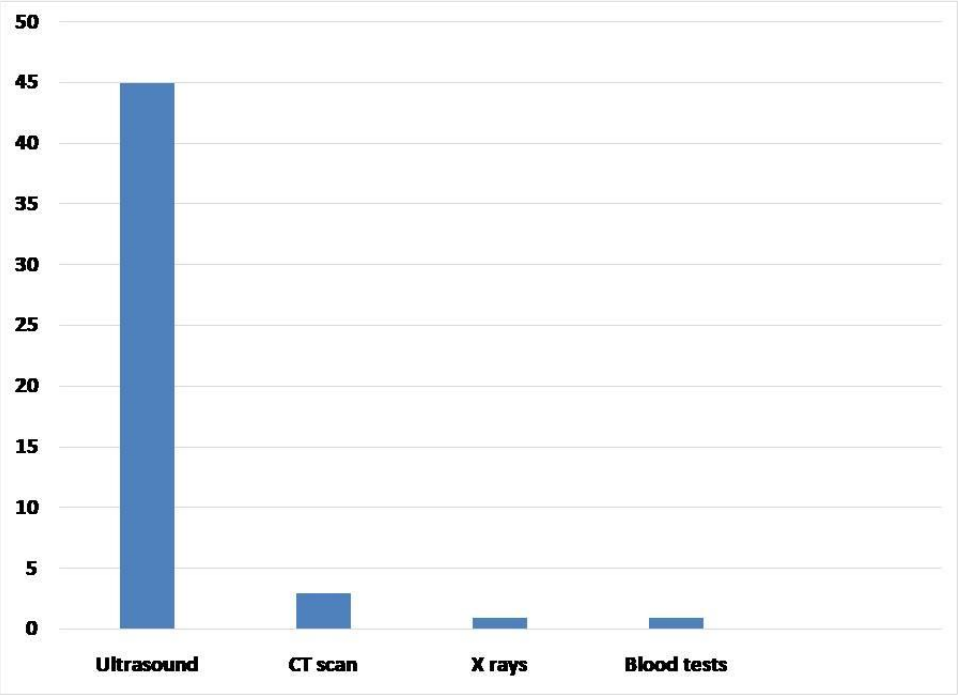

Figure 3.4 The ways of diagnoses of Gallbladder Stones.

d. Recommended Treatment by Doctor

This study provided different treatment options for gallbladder stones as recommended by doctors. i.e., Gallbladder removal surgery (cholecystectomy): This method involves surgically removing the gallbladder, which is the most definitive treatment for gallbladder stones. In the givens study, the frequency for gallbladder removal surgery were 40, indicating that it is the most frequently recommended treatment option by doctors. Lifestyle changes (diet, exercise): Making lifestyle changes such as adopting a healthier diet and engaging in regular exercise can help manage gallbladder stones in certain cases. These changes may help reduce symptoms and prevent the progression of the condition. The frequency for lifestyle changes in the study were 4, suggesting that it is the second most frequently recommended treatment option. Medication: Medications may be prescribed to dissolve gallstones or to manage symptoms associated with gallbladder stones. These medications may include bile acid pills or certain medications to alleviate pain or inflammation. The frequency for medication in the data were 6, indicating that it is the third most frequently recommended treatment option. Based on the frequencies provided in the study, the main recommended way of treatment for gallbladder stones is gallbladder removal surgery (cholecystectomy), which is the most frequently, suggested option. This suggests that doctors consider surgical removal of the gallbladder as an effective and common treatment approach for gallbladder stones. On the other hand, lifestyle changes (diet, exercise) have a lower frequency, indicating that they are the second most recommended treatment option. Lifestyle changes may be suggested for individuals who prefer non-surgical approaches or for those with milder cases of gallbladder stones. Medication has the highest frequency among the three options,

indicating that it is the least frequently recommended treatment option among the listed options (Rebholz et al., 2018). This suggests that medication may be considered as a secondary or supportive treatment for managing symptoms or dissolving gallstones in certain cases, but it may not be the primary choice for long-term management or complete resolution of gallbladder stones (Rebholz et al., 2018) (Figure 3.5).

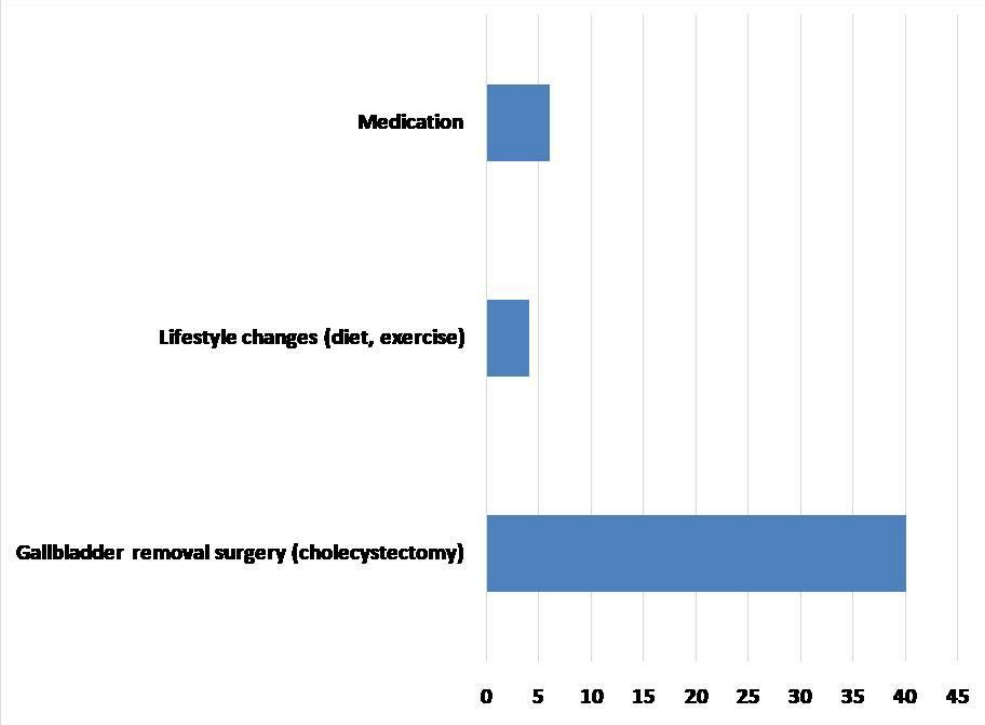

Figure 3.5 Recommended Treatment for gallbladder stone by doctor.

e. Types of Treatment taken by patients

This study provided different types of treatments recommended by doctors i.e., Operation/Surgery: This category represents surgical interventions, specifically cholecystectomy, which involves the removal of the gallbladder. Cholecystectomy is the most common and effective treatment for gallbladder stones. The frequency for operation/surgery in the data is 76, indicating that it is the most frequently recommended treatment option among the listed options. Medications: Medications are commonly prescribed to manage various medical conditions, including those related to the gallbladder. In the context of gallbladder treatment, medications may be given to dissolve gallstones, alleviate pain, or address inflammation. The frequency for medications in the data is 14, suggesting that it is the second most frequently recommended treatment option. Other: The "Other" category likely includes alternative treatments or procedures not specified in the data. Without further information, it is difficult to provide a specific explanation for the data category. The frequency for other in the data is 6, suggesting that it is less commonly recommended compared to medications and surgery.

Based on the frequencies provided in the data, the major type of treatment for gallbladder issues appears to be operation/surgery, with a frequency of 76. This indicates that surgical removal of the gallbladder (cholecystectomy) is the primary and most commonly

recommended treatment approach for gallbladder conditions, including gallbladder stones. Medications have a frequency of 14, suggesting that they are the second most frequently recommended treatment option. Medications may be prescribed for various purposes, including managing symptoms, dissolving gallstones, or addressing inflammation.

f. Monthly Hospital Visits to hospitals for examination of Gallbladder Stones

This study provided about the frequency of the patients visits to the hospital for the treatment of gallblader stone on monthly bases. The data present different catagries i.e. Daily bases: This category represents individuals who visit hospitals on a daily basis for the examination of gallbladder stones. In the given data, the frequency for daily visits is 24. Weekly: This category represents individuals who visit hospitals on a weekly basis for the examination of gallbladder stones. In the data, the frequency for weekly visits is 26. Monthly: This category represents individuals who visit hospitals on a monthly basis for the examination of gallbladder stones. In the given data, the frequency for monthly visits is 31, which is the highest value among the four categories. Never: This category represents individuals who have never visited hospitals for the examination of gallbladder stones.

In the data, the frequency for never visits is 19. Based on the frequencies provided in the data, the maximum value is associated with monthly hospital visits (31), indicating that the highest number of individuals in the given population visit hospitals on a monthly basis for gallbladder stone examination. This suggests that a significant portion of the population seeks medical attention and monitoring of their gallbladder condition on a monthly basis. The minimum value is associated with daily hospital visits (24), indicating that the lowest number of individuals in the given population visit hospitals on a daily basis for gallbladder stone examination. This suggests that the least number of individuals undergo daily examinations specifically for gallbladder stones (Figure 3.6).

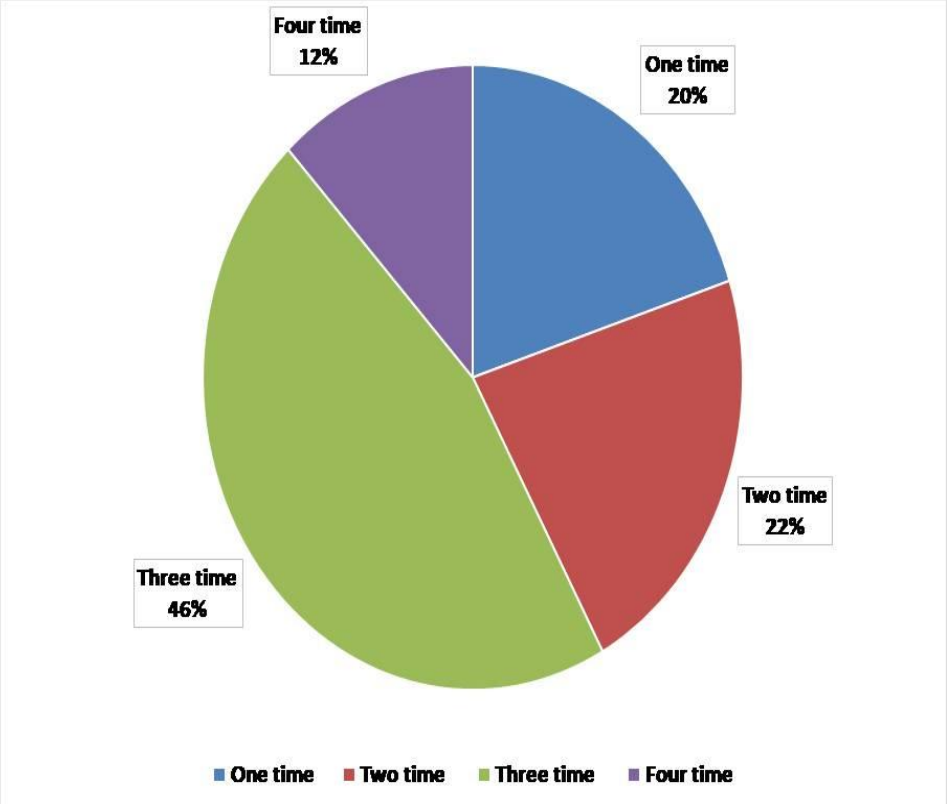

Figure 3.6 The frequency of patients visits to the hospitals for treatment of gallbladder stone.

g. Family History of gallbladder stones

This study provides data about the frequency of family history of gallbladder stones among different relatives. i.e., Parent: This category represents individuals who have a parent with a history of gallbladder stones. In the given data, the frequency for individuals with a parent with gallbladder stones is 52. Sibling: This category represents individuals who have a sibling (brother or sister) with a history of gallbladder stones. In the data, the frequency for individuals with a sibling with gallbladder stones is 28. Grandparent: This category represents individuals who have a grandparent with a history of gallbladder stones. In the given data, the frequency for individuals with a grandparent with gallbladder stones is 20.

Based on the frequencies provided in the data, the maximum value is associated with parents (52), indicating that the highest number of individuals in the given population has a parent with a history of gallbladder stones. This suggests that having a parent with gallbladder stones may be a significant risk factor for developing gallbladder stones. The minimum value is associated with grandparent (20), indicating that the lowest number of individuals in the given population have a grandparent with a history of gallbladder stones. This suggests that having a grandparent with gallbladder stones may be less common compared to having a parent or sibling with the condition (Figure 3.7).

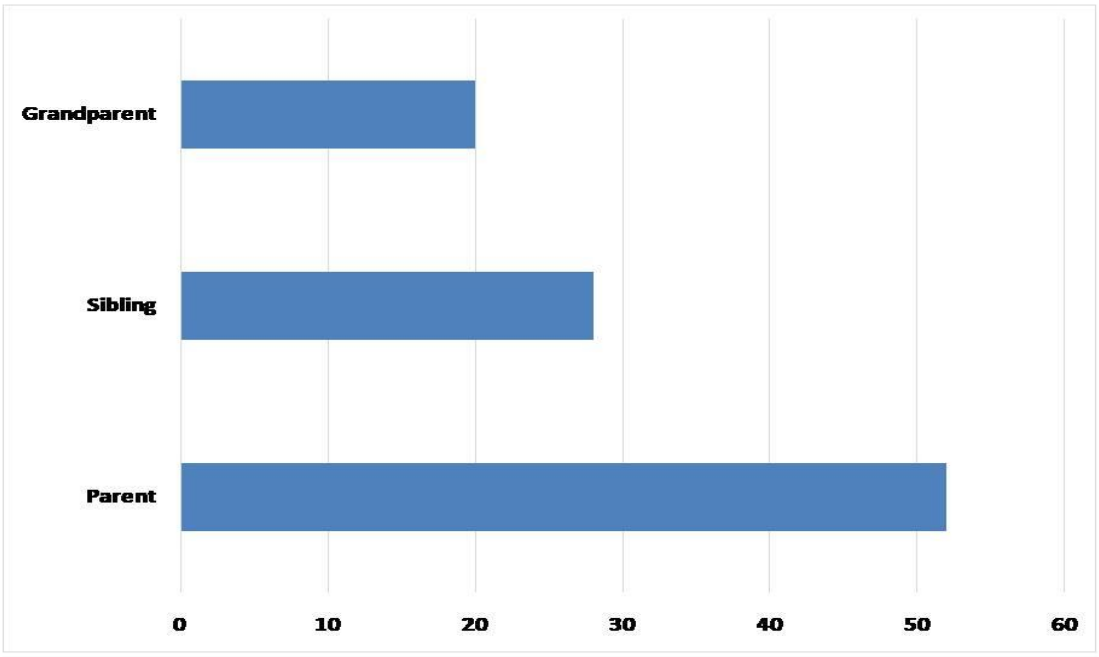

Figure 3.7 The family history of the patients suffering from gallbladder stones in the study area.

h. Physical Activities and Gallbladder Stones

The data about physical activities and gallbladder stones show the frequency of physical activity engagement among a group of individuals in relation to the development of gallbladder stones. The numbers represent the count of individuals falling into each category. The 24 individuals engage in physical activity on a daily basis, 26 individuals engaged in physical activity on a weekly basis, 31 individuals engage in physical activity on a monthly basis and 19 individuals never engage in any physical activity. To examine the relationship between physical activity and gallbladder stones based on this data, we can observe the following: Higher physical activity frequency: Individuals who engage in physical activity on a daily or weekly basis (24 + 26 = 50 individuals) have a higher level of physical activity compared to those who engage monthly or never (31 + 19 = 50 individuals). Insufficient information: Without additional data, such as the total number of individuals in the group or the incidence of gallbladder stones, it is challenging to draw definitive conclusions regarding the relationship between physical activity and gallbladder stones (Rawla et al., 2019). It's important to note that the development of gallbladder stones can be influenced by various factors, including diet, genetics, lifestyle, and underlying medical conditions. While regular physical activity is generally associated with numerous health benefits, its specific impact on gallbladder stones may require a more comprehensive analysis and consideration of other factors.

This study encompasses various research studies conducted to investigate the prevalence and risk factors of gallstone disease in different countries and populations. The studies aimed to shed light on the epidemiology of gallstone disease and provide insights for preventive strategies and clinical management. Another study conducted in Uganda to determine the prevalence and risk factors of gallstone disease among patients undergoing ultrasonography at Mulago hospital (Nimanya et al., 2020). The study found that the

prevalence of gallstone disease was 8.1%, and significant risk factors included age, female gender, and higher body mass index (BMI). Their recommendation focused on implementing preventive strategies targeting high-risk groups and promoting healthy lifestyle habits (Bilal *et al.,* 2016) conducted a population-based study in Pakistan, aiming to assess the prevalence and risk factors of gallstone disease among adults in Karachi, South Pakistan. They found a prevalence of 11.6% and identified risk factors such as age, gender, obesity, and diabetes. The researchers recommended the development of targeted interventions and preventive measures based on the identified risk factors. A study in Pakistan, aiming to determine the prevalence of gallstone disease and its correlation with age among individuals undergoing abdominal ultrasound in Gujranwala (Nasir et al., 2021). They reported a prevalence of 11.1% and found a significant correlation between age and gallstone occurrence. The researchers recommended emphasizing regular screenings and health education programs to raise awareness about the risks of gallstone disease. Another study in Pakistan to determine the prevalence of gallstone disease in patients with hepatitis C virus infection. They found that the prevalence of gallstone disease was 16.1% among hepatitis C virus-infected patients. Their recommendation suggested considering routine screening for gallstone disease in patients with hepatitis C virus infection (Haq et al., 2017).

A significance increases in the prevalence of cholelithiasis in younger age groups and suggested further research to understand the underlying causes of this changing demographic pattern (Ahmed et al., 2017). A study provided an overview of the epidemiology of gallbladder disease, including cholelithiasis and cancer. Their findings indicated that cholelithiasis is more common in women, older individuals, and certain ethnic groups. They emphasized the importance of early diagnosis, risk factor modification, and appropriate management strategies (Stinton and Shaffer, 2012). A study in China were to investigate the prevalence and risk factors of gallbladder stones and polyps in Liaoning. They found prevalence rates of 4.7% for gallbladder stones and 7.7% for gallbladder polyps. Age, gender, BMI, and metabolic syndrome were associated risk factors. The researchers recommended promoting healthy lifestyle habits and regular check-ups to prevent and manage gallbladder stones and polyps (Zhang et al., 2022).

Another study provided guidelines for managing dyslipidemia and preventing cardiovascular disease. Their guidelines covered various aspects of lipid management, risk assessment, and treatment strategies. Their recommendation urged the implementation of the recommended guidelines in clinical practice for effective dyslipidemia management and cardiovascular disease prevention (Jellinger et al., 2017). A study in Iraq to assessed the prevalence of gallstone disease in relation to age, sex, and body mass index (BMI) in Tikrit City. They reported a prevalence of 6.8% and identified older age, female gender, and higher BMI as associated risk factors (Khalaf et al., 2020). The researchers recommended promoting healthy weight management and regular screenings to reduce the burden of gallstone disease.

4. CONCLUSION AND RECOMMENDATIONS

4.1 Recommendations

This study recommends following recommendations on the bases of findings of this study.

1. Maintain a Healthy Weight: Since obesity is identified as a potential risk factor for gallbladder stones, it is crucial to maintain a healthy weight through proper diet and regular exercise. By adopting a healthy lifestyle, you can reduce the risk of developing gallbladder stones.

2. Monitor Cholesterol Levels: High cholesterol levels contribute to the formation of gallstones. To lower your risk, it is important to manage cholesterol levels through a balanced diet low in saturated fats and regular exercise. Consult with a healthcare professional to determine your cholesterol levels and develop an appropriate plan.
3. Consider Family History: A family history of gallbladder stones, may have a higher risk of developing them as well. It is advisable to be aware of family history and discuss it with your healthcare provider. They can provide guidance on preventive measures and regular screenings.
4. Avoid Rapid Weight Loss: Sudden or rapid weight loss can increase the risk of gallbladder stone formation. The peoples who are planning to lose weight, it is important to do so gradually and under the guidance of a healthcare professional. They can help you develop a safe and sustainable weight loss plan.
5. Seek Medical Attention: If someone experience symptoms or suspect gallbladder stones, it is essential to seek medical attention promptly. Diagnostic methods such as ultrasound, CT scan, X-rays, or blood tests can help determine the presence of gallstones. Based on the diagnosis, healthcare provider can recommend appropriate treatment options, such as gallbladder removal surgery (cholecystectomy) or other alternatives.

4.2 Conclusion

This study was conducted to analyses the prevalence, demographic distribution, risk factors, etiological factors, diagnostic methods, recommended treatments, hospital visits, family history, and physical activities associated with gallbladder stones in District Abbottabad, KPK, Pakistan provides valuable insights. The findings indicate that the majority of respondents belonged to the age group of 41 to 45 years, with smaller-sized gallbladder stones being the most common. Risk factors such as obesity, high cholesterol levels, family history, and rapid weight loss were identified. Ultrasound emerged as the most frequently used diagnostic method, followed by CT scan, X-rays, and blood tests. Gallbladder removal surgery (cholecystectomy) was the most recommended treatment by doctors, while operation/surgery was the most common treatment choice among patients. Monthly hospital visits were found to be the most prevalent, and having a parent with gallbladder stones was the most frequently reported family history. The relationship between physical activity and gallbladder stones requires further investigation. These findings highlight the importance of early detection, proper diagnosis, and appropriate treatment strategies for gallbladder stone management, taking into account the demographic and risk factor profiles of the affected population.

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Annexes-I Data collection Form and Questionnaire

Part I Data Collection Form (Hospital)

1. Demographic Information:
- Patient ID: [ ]
- Age: [ ]
- Gender: [ ]
- Occupation: [ ]
- Address: [ ]
- Contact Number: [ ]

2. Level/Stage of Gallbladder Stones:
- [ ] Stage 1: Small stones (<5 mm)
- [ ] Stage 2: Moderate stones (5-10 mm)
- [ ] Stage 3: Large stones (>10 mm)

3. Causes of Gallbladder Stones:
- [ ] Obesity
- [ ] High cholesterol levels
- [ ] Family history
- [ ] Rapid weight loss
- [ ] Certain medications
- [ ] Other (specify): [ ]

4. Ways of Diagnoses:
- [ ] Ultrasound
- [ ] CT scan
- [ ] X-ray
- [ ] Blood tests

5. Recommended Treatment:
- [ ] Medication
- [ ] Gallbladder removal surgery (cholecystectomy)
- [ ] Lifestyle changes (diet, exercise)
- [ ] Other (specify): [ ]

6. Monthly Hospital Visits:

Month	January	February	March	April	May	June	July	August	September	October	November	December
Number												

Part II Questionnaire for Patients

1. Demographic Information:

a. Age: _____.
b. Gender: _____.
c. Occupation: _____.
d. Ethnicity: _____.

2. Medical History:

i. Have you ever been diagnosed with gallbladder stones?
a. Yes b. No
ii. If yes, how long ago were you diagnosed?

a. One month b. Two month
c. Six month d. More than six months

iii. Have you undergone any treatment for gallbladder stones?
a. Yes b. No

iv. If yes, what type of treatment did you receive?
a.. Medications b. Operation / Surgery

3. Family History:

i. Do any of your family members have a history of gallbladder stones?
a. Yes b. No

ii. If yes, please specify the relationship.
a. Parent b. Sibling d. Grandparent

4. Lifestyle and Dietary Factors:

i. Are you overweight or obese?
a. Yes b. No

ii. Do you follow a balanced diet?
a. Yes b. No

iii. Do you consume a high-fat diet?
a. Yes b. No

iv. How often do you engage in physical exercise?
a. Daily b. Weekly c. Monthly d. Never

5. Medical Conditions:

i. Do you have a history of diabetes?
a. Yes b. No

ii. Have you been diagnosed with high cholesterol levels?
a. Yes b. No

iii. Have you experienced rapid weight loss recently?
a. Yes b. No

iv. Do you have any other medical conditions?
a. Yes b. No

6. Etiological Factors:

i. Have you ever had a previous gastrointestinal surgery?
a. Yes b. No

ii. Have you taken any medications known to increase the risk of gallbladder stones?
a. Yes b. No

iii. Have you been diagnosed with certain liver diseases?
a. Yes b. No

iv. Which diseases: _____.

7. Symptoms:

i. Do you experience abdominal pain?
a. Yes b. No

ii. If yes, please describe the location and severity: _____.

iii. Have you noticed any changes in bowel movements?
a. Yes b. No

iv. Do you experience nausea or vomiting?
a. Yes b. No

v. Have you observed any yellowing of the skin or eyes?
a. Yes b. No

8. Impact on Daily Life:

i. How has the presence of gallbladder stones affected your daily activities?
_____.

ii. Have you missed work or school due to gallbladder stone-related issues?
a. Yes b. No

iii. Have you experienced any emotional distress or anxiety due to gallbladder stones?
a. Yes b. No

9. Treatment Experience:

i. Have you received any treatment for gallbladder stones? If yes, please describe the treatment.
a. Yes b. No

ii. Are you currently undergoing any treatment for gallbladder stones?
a. Yes b. No

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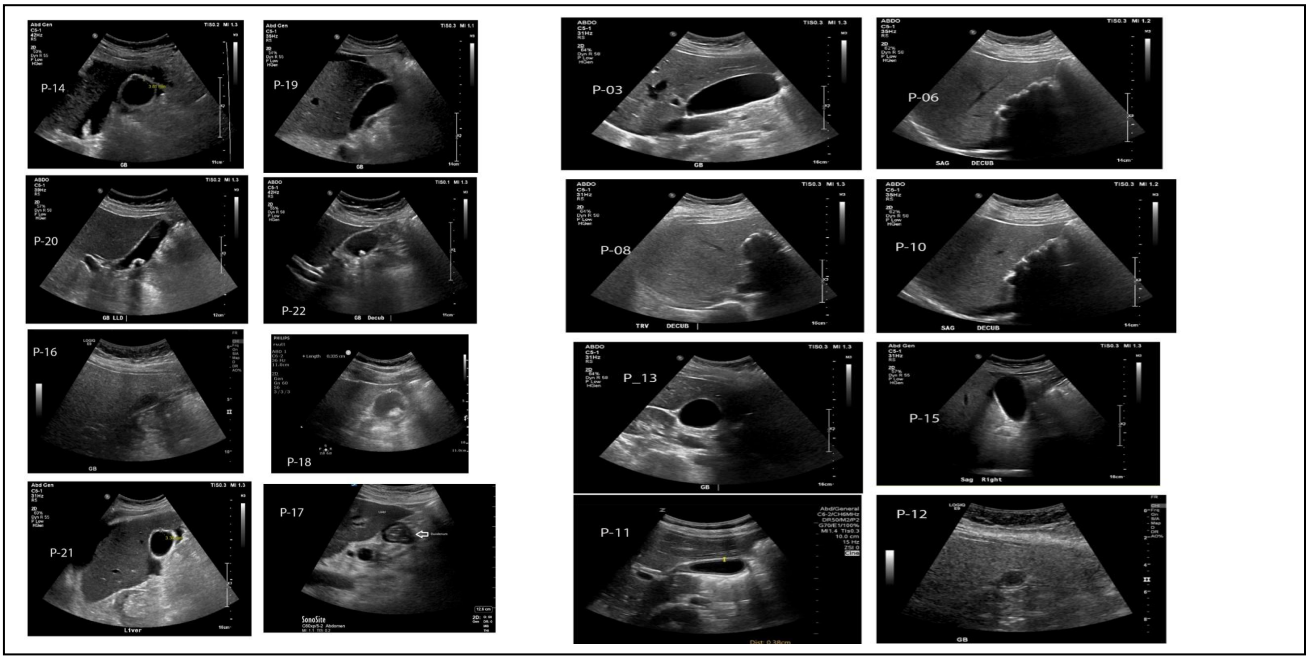
Annexes-II



Ultrasound Results (Gallbladder stone) of Patients Participate in the study