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A Study on the Prevalence of Inguinal Hernia at Keluarga Sehat Hospital Pati, Indonesia

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Background and Objective: Inguinal hernia is a common medical condition, with potential serious complications such as incarcerated or strangulated hernias. Keluarga Sehat Hospital Pati, a Type C hospital, reports a significant number of patient visits. This study aims to determine the prevalence of inguinal hernia at Keluarga Sehat Hospital Pati in 2023 and to describe the demographic characteristics of the affected patients.
Methods: This descriptive observational study analyzed the medical records of inguinal hernia patients treated at Keluarga Sehat Hospital Pati in 2023. Data were analyzed using SPSS for univariate analysis of categorical (gender, occupation) and numerical (age) variables.
Results: Among 164 inguinal hernia patients, the majority were male (157 patients; 95.7%) with a mean age of 52.19 years (SD = 19.94 years). The most common age groups were 52-61 years (29.9%) and 62-71 years (29.3%). The most frequent occupations were farmers (18.9%) and self-employed individuals (10.4%).

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Conclusion: The prevalence of inguinal hernia at Keluarga Sehat Hospital Pati was predominantly found in males, particularly within the 52-71 years age group. These findings highlight the need for better healthcare planning and public awareness, especially for individuals in physical labor occupations and those in middle to older age groups.

Keywords Inguinal hernia; demographic characteristics; prevalence; healthcare planning.

1. INTRODUCTION

An inguinal hernia is defined as the displacement of a portion of the peritoneum, sometimes accompanied by abdominal viscera, that passes under the skin through the inguinal canal or directly through the abdominal muscles. It is a condition that predominantly affects men between the ages of 20-60 years, with over 20 million cases reported globally each year (Nowacka-Woszuk 2021). The diagnosis of inguinal hernia is typically made based on clinical characteristics, with strangulation being a serious complication that must be carefully considered, as it can lead to life-threatening situations (Sebastian and Varkey 2024).

Globally, the incidence of inguinal hernia varies by region, with the United States reporting approximately 800,000 new cases annually, and France showing that inguinal hernia surgeries account for 17.2% of all surgeries performed (Guenther et al. 2021, Garofil et al. 2023). A study conducted at Prof. Dr. Margono Purwokerto Hospital found that between January 2021 and April 2022, most inguinal hernia patients were male (238 subjects; 83.5%), and there was a clear trend of increasing prevalence with age (Iwan et al. 2024). Similarly, research by Suryadinata et al. at Buleleng Regency Hospital revealed that the majority of patients were older adults, with 39% of patients being over 65 years old. The study also found that 92% of the patients were male, and 75% of them underwent surgery with mesh. A similar trend was observed in findings from Meuraxa Hospital in Banda Aceh, where the highest prevalence of inguinal hernia was reported in patients aged 41-65 years (Zuar et al. 2023, Iwan et al. 2024).

Inguinal hernias typically present with a range of symptoms, such as a lump or pain in the inguinal area, which may worsen with physical activity or coughing. In some cases, severe pain or obstructive symptoms such as those caused by incarceration or strangulation can develop (Bates 2023). Physical examination is the primary diagnostic method, where the inguinal area and scrotum are palpated while the patient performs activities that increase intra-abdominal pressure, such as coughing or the Valsalva maneuver (Aiolfi et al. 2021, Seyi-Olajide 2024).

The main complications of inguinal hernia are incarceration and strangulation, which can be life-threatening and require urgent intervention (Ma et al. 2023) have shown that incarcerated hernias have significantly higher morbidity and mortality rates compared to elective repairs (Williams et al. 2020). Such complications highlight the importance of timely intervention, which is crucial in reducing patient morbidity and mortality.

Rumah Sakit Keluarga Sehat Pati, a type C hospital, plays a critical role in managing patients in the Pati and Jepara areas. With a history of significant inpatient visits—15,522 in 2021 and 19,690 in 2019—and a high volume of surgical procedures (5,545 surgeries in 2021), it serves as a referral center for complex cases (Keluarga Sehat Hospital Reports, 2016-2021). The hospital's surgical division, in particular, has seen a large number of inguinal hernia cases, which necessitates routine evaluations to improve clinical outcomes and facilitate better management practices. Given the increasing prevalence of inguinal hernia and its potential complications, it is essential to conduct further research to understand its epidemiology within local populations. This study aims to determine the prevalence of inguinal hernia at Rumah Sakit Keluarga Sehat Pati in 2023. The findings of this study are expected to contribute to decision-making in patient management, including the optimization of clinical services and the targeting of high-risk groups through education and prevention strategies, ultimately improving patient outcomes.

2. METHODS

Descriptive observational study of inguinal hernia patients who underwent inpatient/outpatient care at Keluarga Sehat Hospital Pati in 2023 (Rol et al. 2021). The research subjects were obtained using the whole sampling method, namely all patients who met the inclusion criteria and did

not have exclusion criteria would be used as research subjects, by evaluating patient medical record data. The inclusion criteria of the study were 1) patients diagnosed with inguinal hernia based on the evaluation of a surgeon, 2) having complete subject characteristic data in the medical record, including gender, age, employment status, and marital status. Exclusion criteria were patients with recurrent hernia. All data were evaluated for completeness before proceeding to data analysis. Data analysis was performed using the statistical application SPSS edition 29 (Pallant 2020). Analysis was carried out using univariate tests, namely categorical data will be reported as frequency and percentage values while numerical data will be reported as mean, standard deviation, median value, minimum value and maximum value.

3. RESULTS

The evaluation conducted on all patients diagnosed with inguinal hernia at Keluarga Sehat Hospital Pati in 2023 obtained the following results.

Table 1. Demographics of research subjects

Variable		n (%)	Mean ± SD	Median (min-max)
Gender			-	-
1.	Men	157 (95,7)		
2.	Women	7 (4,3)		
Age			52.19 ± 19.94	59 (0.9-85)
1.	0-11	14 (8.5)		
2.	12-21	6 (3.7)		
3.	22-31	5 (3)		
4.	32-41	10 (6.1)		
5.	42-51	18 (11)		
6.	52-61	49 (29.9)		
7.	62-71	48 (29.3)		
8.	72-81	13 (7.9)		
9.	> 81	1 (0.6)		
Occupation			-	-
1.	Student	2 (1.2)		
2.	Merchant	3 (1.8)		
3.	Civil servant	5 (3)		
4.	Self-employed	17 (10.4)		
5.	Private company employee	6 (3.7)		
6.	Fisherman	2 (1.2)		
7.	Farmer	31 (18.9)		
8.	Retired	3 (1.8)		
9.	Army	1 (0.6)		
10.	Police Officer	1 (0.6)		
11.	Casual Employee	1 (0.6)		
12.	Laborer	6 (3.7)		
13.	Housewife	1 (0.6)		
14.	Other	85 (51.8)		
Marriage Status			-	-
1.	Married	137 (83.5)		
2.	Not Married	27 (16.5)		

Note: In general, the relationship between marital status and the prevalence of inguinal hernia is indirect. To draw clearer conclusions, further data is needed regarding the number of inguinal hernia cases in each group (married and not married). Additional analysis, taking into account other factors such as age, occupation, and lifestyle, is also important to understand whether there is any connection between marital status and the prevalence of inguinal hernia (Pivo et al. 2023)

Gender: The majority of inguinal hernia patients are male, which is consistent with the general finding that men are more prone to this condition.

Age: The prevalence of inguinal hernia increases with age, with the age group of 52-71 years being the most commonly diagnosed.

Occupation: Occupations involving physical activity or heavy lifting, such as farmers and entrepreneurs, are more commonly associated with inguinal hernia.

Marital Status: No direct correlation was found between marital status and the prevalence of inguinal hernia, although the majority of patients were married.

Inguinal hernia patients were predominantly male (157 patients; 95.7%) compared to female (7 patients; 4.3%). The age of all patients had a mean of 52.19 years with a standard deviation of 19.94 years, a median value of 59 years with the youngest age of 0.9 years and the oldest age of 85 years. Evaluation of the age grouping found that most patients were dominated by the age range of 52-61 years (29.9%) and 62-71 years (29.3%).

The most reported occupation was others (85 subjects; 51.8%) followed by farmers (31 subjects; 18.9%) and self-employed (17 subjects; 10.4%). Evaluation of marital status found that most subjects were married (137 subjects; 83.5%).

4. DISCUSSION

Inguinal hernia patients were dominated by the age range of 52-61 years and 62-71 years, where male patients dominated most of the subjects.

Agarwal PK, who assessed the demographics of inguinal hernia patients, found that based on the evaluation of 110 patients who underwent inguinal hernia surgery, the majority of patients were male (100 patients; 97.27%) with the most reported age being >50 years (43 patients; 39%). The male to female ratio of inguinal hernia incidence was 32 (Balamaddaiah and Reddy 2016). Iwan IA, et al who assessed the prevalence and characteristics of inguinal hernia patients obtained similar results that inguinal hernia patients were mostly suffered by men (95.6%), Spearman correlation test between age and type of inguinal hernia obtained p value = 0.033 (<0.05). There is a relationship between the incidence of inguinal hernia with a history of chronic cough (68.9%) and doing heavy work (82.35%) (Heiran et al. 2022).

Inguinal hernias are more common in men than women. Approximately 90% of inguinal hernia surgeries are performed in men, while 70% of femoral hernia surgeries are performed in women. The estimated lifetime risk of inguinal hernia in men is 27% and 3% in women. The high incidence of inguinal hernia in men is due to their involvement in more strenuous activities and weight lifting as well as anatomical differences between men and women. The most commonly reported risk factor for inguinal hernia is heavy lifting (~55%), followed by altered bowel habits (~36.36%) Smoking and diabetes are also associated as risk factors for inguinal hernia (Heiran et al. 2022).

The prevalence of inguinal hernia is age-dependent, and in males, has a bimodal distribution curve, with a first peak at one year of age and a second peak after the fourth decade of life. Inguinal hernias may present in the pediatric age group (congenital) or later in adults, which is usually considered an acquired condition. Persistence of the processus vaginalis (PPV) is involved in the etiopathogenesis of congenital hernias. The presence of PPV alone does not cause inguinal hernia. PPV and other risk factors such as family history, tissue weakness, and strenuous activity predispose to inguinal hernia. The etiology of inguinal hernia in adults is multifactorial and influenced by occupational, environmental and hereditary factors. Hypothetically, obesity is a high risk factor for inguinal hernia. The pathophysiology of hernias is based on the concept of increased intra-abdominal pressure (mechanical effect) affecting a weak abdominal wall (Agarwal et al. 2023, Köckerling 2017).

Some types of hernias can return on their own or with manual assistance, while others cannot return either spontaneously or manually due to adhesion between the hernia contents and the hernia sac wall, so that the hernia contents cannot return to their original place. This can lead to difficulty walking or moving around, interfering with activities. If there is pressure on the hernia ring, the contents can become trapped and cause strangulated hernia, which is characterized by symptoms of ileus or intestinal obstruction. This condition disrupts blood circulation, reduces oxygen supply, and risks causing ischemia and necrosis of the hernia contents. If the hernia sac contains intestine, perforation can occur, potentially leading to a local abscess or primary abscess if there is a connection to the abdominal cavity. Intestinal

obstruction can also reduce intestinal peristalsis, leading to constipation. In the case of strangulation, symptoms of ileus such as abdominal distension, vomiting and obstipation will be present. The pain will be sudden and persistent, and the area of the lump will appear redder and redder (Griffiths and Glancy 2023, Bhattacharya et al. 2020). The prevalence of inguinal hernia aims to identify how common this condition is within the studied population. Complications such as perforation, intestinal obstruction, strangulation, and ileus symptoms are risks associated with inguinal hernia that can worsen the patient's condition. If the prevalence is high, prompt preventive measures and treatment can help reduce the risk of more serious complications. With a clear understanding of inguinal hernia prevalence, hospitals and healthcare facilities can plan better management strategies, with particular attention given to cases at higher risk of complications like intestinal obstruction or strangulation. This will contribute to reducing the incidence of severe complications that can affect the patient's quality of life (Khan 2023).

The most reported occupations related to inguinal hernia cases were others, farmers and self-employed. Most of the subjects were married. Kuijer PPFM, et al, in a systematic review and meta-analysis study related to the relationship of work to the incidence of inguinal hernia found that there was a significant relationship between work with physical demands (OR 2.30, 95% CI 1.56-3.40) on the incidence of inguinal hernia. Two prospective studies, which included 382 and 22,926 cases, revealed an association for male workers that standing or walking >6 hours per workday (OR 1.45, 95% CI 1.12-1.88) or cumulative lifting >4000 kg per workday (OR 1.32, 95% CI 1.27-1.38) were associated with lateral inguinal hernia incidence (Heiran et al. 2022). Vad MV, et al who evaluated the relationship between exposure to mechanical work and lifestyle to inguinal hernia surgery in men found that the risk of inguinal hernia surgery increased with standing/walking time with an HR of 1.45 (95% CI 1.12 to 1.88) for ≥6 hours/day compared to <4 hours/day (Shyam and Rapsang 2013).

The underlying mechanism of lateral hernia formation is that increased intra-abdominal pressure during standing/walking causes abdominal viscera to protrude through the inguinal canal. An upright position is also a prerequisite for the inguinal canal to open, whereas sitting may preclude hernia formation. The cumulative effect of gradual widening of a pre-existing opening over years of exposure to high risk factors will lead to a gradual increase in hernia formation (Chang et al. 2016).

5. CONCLUSION

The study on the prevalence of inguinal hernia at Keluarga Sehat Hospital Pati in 2023 reveals that the majority of patients diagnosed with inguinal hernia are male, with a significant proportion in the age group of 52-61 years. Additionally, occupations with higher physical demands, such as farming, were more commonly associated with the condition. The study highlights that while marital status was not directly correlated with the prevalence of inguinal hernia, factors like age, occupation, and physical activity seem to play a more significant role in the incidence of this condition.

In conclusion, inguinal hernia is predominantly seen in middle-aged to elderly men, especially those engaged in occupations involving strenuous physical labor. Timely diagnosis and appropriate interventions are essential, as complications like incarceration and strangulation can significantly affect patient outcomes. Further studies considering other contributing factors, such as lifestyle and genetic predispositions, are recommended to improve management strategies and reduce the incidence of severe complications.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

The authors hereby state that no generative AI tools such as large language models (ChatGPT, COPILOT, etc.) or text-to-image generators were utilized in the creation or editing of this work.

DATA AVAILABILITY

All relevant data are included in the paper and its supporting information files. This study will assist researchers in identifying critical areas A Study on the Prevalence of Inguinal Hernia At Keluarga Sehat Hospital Pati In 2023.

CONSENT

It is not applicable.

ETHICAL APPROVAL

As per international standards or university standards written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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