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Relationship Between Age and Occupation with the Incidence of Inguinal Hernia at Nur Hidayah Hospital

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ABSTRACT

An inguinal hernia occurs when an organ or tissue protrudes through a weakened area in the abdominal wall, often at the locus minoris resistentiae. Age and occupation are significant risk factors for this condition. This study aims to examine the relationship between age and occupation with the incidence of inguinal hernia at Nur Hidayah Hospital, Bantul. This study utilized an observational cross-sectional design, analyzing medical records from Nur Hidayah Hospital, Bantul, for the 2022–2023 period. A purposive sampling technique was applied, yielding 45 medical records. Among the 45 patients, 91.9% (41 patients) were male, reaffirming the male predominance in inguinal hernia cases. Patients aged ≥45 years accounted for 75.6% (34 cases), highlighting the role of age-related muscle weakening. Occupation was also a crucial factor, with 48.9% (22 patients) engaged in heavy labor, suggesting a strong occupational influence. The majority of cases (86.7%, 39 cases) were medial inguinal hernias commonly associated with acquired muscle weakness. Statistical analysis revealed a significant relationship between age and inguinal hernia incidence ($p = 0.001$) and between occupation and inguinal hernia incidence ($p = 0.002$). This study confirms a strong correlation between age, occupation, and inguinal hernia incidence at Nur Hidayah Hospital, Bantul. Older individuals and those engaged in physically demanding jobs are at higher risk. These findings emphasize the need for preventive measures, including workplace ergonomics, core-strengthening exercises, and early screening programs for high-risk individuals.
Keywords: Inguinal Hernia, Age, Occupation, Prevention.

INTRODUCTION

Inguinal hernias represent a significant health concern globally, characterized by the protrusion of abdominal contents through a defect in the abdominal wall, specifically in the inguinal region. (Bikbov et al., 2020) (Schlosser et al., 2023). This condition is particularly prevalent among males, with a lifetime risk estimated between 27% to 43% for men and 3% to 6% for women, highlighting a pronounced gender disparity in incidence rates. (Van Silfhout et al., 2022). The demographic distribution of inguinal hernias reveals that they are predominantly observed in adult males, with various studies indicating that the male-to-female ratio can be as high as 10:1 (Jha, 2020) (Wismayer, 2021).

The pathophysiology of inguinal hernias is multifactorial, involving both congenital and acquired factors. Congenital inguinal hernias are often associated with the failure of the processus vaginalis to close, which is more common in males due to anatomical differences. (Mabula & Chalya, 2012). In contrast, acquired hernias can develop due to increased intra-abdominal pressure from factors such as obesity, heavy lifting, and chronic cough. (Vijayakumar & Alagar, 2003).

testing, recent studies have suggested that obesity may paradoxically reduce the risk of developing inguinal hernias, as increased intra-abdominal fat may provide a protective effect against herniation (Riaz et al., 2023)(Melwani et al., 2020).

Demographic studies have also indicated a higher prevalence of right-sided inguinal hernias compared to left-sided ones, with ratios reported as high as 2.1:1 (Wismayer, 2021)(Mabula & Chalya, 2012). This lateralization may be attributed to anatomical and physiological differences in the inguinal canal's structure and function. Furthermore, the incidence of inguinal hernias tends to be higher in certain populations and geographic regions, with reports indicating that in some areas of Africa, the incidence can be as low as 175 cases per 100,000 population annually (Sanjaya, 2023).

The incidence of inguinal hernias is notably influenced by various demographic factors, particularly age and occupation. (Abebe et al., 2022)(Kuijer et al., 2020). This age-related susceptibility can be attributed to the progressive weakening of the abdominal wall and connective tissues, which are exacerbated by factors such as chronic obstructive pulmonary disease (COPD), heavy lifting, and other lifestyle choices prevalent in older adults. (Patel, 2018)(Bellad & Pratap, 2018). Moreover, occupation plays a significant role in the development of inguinal hernias, with certain jobs that involve heavy lifting or physical strain being associated with a higher risk of hernia formation. (Patel, 2018).

Age is a well-documented risk factor for inguinal hernias, with studies indicating a bimodal distribution of incidence, peaking in early childhood and again in older adults. (Burcharth et al., 2013). Specifically, middle-aged men are frequently observed to present with recurrent hernias, suggesting that age-related physiological changes may contribute to hernia development. (He et al., 2020). Additionally, older age is associated with increased abdominal wall laxity and other comorbidities that may predispose individuals to hernias. (Vijayakumar & Alagar, 2003). Furthermore, the prevalence of inguinal hernias is notably higher in males, which may be attributed to anatomical differences and lifestyle factors. (Li et al., 2023).

Inguinal hernia is a significant global health issue, particularly among men, who have a much higher lifetime risk compared to women. According to a report from Nur Hidayah Hospital, inguinal hernia cases are frequently found in the elderly (≥45 years) and individuals with physically demanding jobs. This study is urgently needed because, although risk factors such as age and occupation have been identified, local studies exploring the relationship between these factors in specific populations remain limited. A better understanding of this correlation is crucial for developing evidence-based prevention strategies, such as workplace ergonomics programs, core muscle strengthening exercises, and early screening for high-risk groups. Occupation plays a crucial role in the incidence of inguinal hernias, especially for individuals exposed to heavy physical labor or repetitive mechanical strain. Research indicates that jobs involving heavy lifting or mechanical exposure significantly increase the risk of developing inguinal hernias. (Vad et al., 2012). A study revealed that approximately 15% of inguinal hernia cases in men aged 15-65 are related to occupational mechanical exposure. (Peterman et al., 2022). This risk is particularly relevant in regions with high manufacturing activity, where physical labor is a major part of the industry. Additionally, socioeconomic factors also play an important role, as individuals from lower economic strata tend to work in more physically demanding sectors, further increasing their likelihood of developing inguinal hernias. (Sanjaya, 2023).

METHOD

This study employed an observational method with a cross-sectional research design to analyze the relationship between age, occupation, and the incidence of inguinal hernia at Nur Hidayah Hospital, Bantul. A cross-sectional approach was chosen to assess the distribution of risk factors and their association with inguinal hernia at a single point in time. The study population consisted of all patients diagnosed with inguinal hernia at Nur Hidayah Hospital during the 2022–2023 period. A non-

probability purposive sampling technique was used to select medical records that met the inclusion criteria, ensuring relevance to the study objectives.

The inclusion criteria comprised patients diagnosed with inguinal hernia at the hospital and those with complete medical records containing age and occupation details. Records with incomplete data or cases involving recurrent inguinal hernia or other unrelated conditions were excluded from the study. Following these criteria, a total of 45 medical records were obtained and analyzed.

Data collection was conducted through a review of patient medical records, extracting key variables for analysis. The independent variables included age, categorized into <45 years and ≥45 years, and occupation, which was further classified based on physical workload into light work (e.g., office jobs, sedentary tasks), medium work (e.g., moderate physical activity, occasional lifting), and heavy work (e.g., construction, farming, heavy lifting). The dependent variable was the incidence of inguinal hernia, including its classification into medial or lateral types.

For statistical analysis, the Chi-square (χ^2) test was applied to determine the association between age, occupation, and inguinal hernia incidence, with statistical significance set at $p < 0.05$. All data processing and analysis were performed using SPSS software, ensuring accuracy and reliability and minimizing potential calculation errors. This methodological approach enabled a structured and precise evaluation of the relationship between demographic factors and inguinal hernia occurrence.

RESULTS AND DISCUSSION

The study's results highlight the significant demographic and occupational traits associated with inguinal hernia patients at Nur Hidayah Hospital. The study's research subjects' age, occupation, and the prevalence of inguinal hernias at Nur Hidayah Hospital are listed below.

Table 1
Characteristics of Research Subjects

Characteristics	Frequency (N=45)	Percentage (%)
Gender		
Man	41	91,1%
Female	4	8,9%
Age		
<45 year	11	24,4%
≥45 year	34	75,6%
Occupation		
Light	19	42,2%
Medium-Heavy	26	57,8%
Inguinal Hernia		
Lateral	6	13.3%
Medialis	39	86,7%

The table lists the main clinical and demographic traits of 45 inguinal hernia patients who were diagnosed at Nur Hidayah Hospital in Bantul. Due to structural variations in the inguinal canal, inguinal hernias are more common in men, which is consistent with the fact that a considerable majority of the patients were male (91.1%, n = 41). The age distribution revealed that the majority of patients were 45 years of age or older (75.6%, n = 34), indicating that aging is a significant risk factor for the development of hernias due to the weakening of the muscles that support the abdominal wall.

In terms of occupation, over 58% of patients worked in medium-to-heavy labor (such as farming or construction), suggesting that physically demanding occupations are strongly associated with a higher risk of hernias because of increased intra-abdominal pressure and repetitive strain. Medial (direct) inguinal hernias, which are more prevalent in older persons and those with persistent strain on the abdominal wall, accounted for 86.7% (n = 39) of cases when the type of inguinal hernia was categorized. These results emphasize the need to target high-risk populations, especially older men in demanding jobs, and the necessity of preventive strategies such as early screening, safe lifting practices, and abdominal muscle-strengthening activities.

A total of 45 patient samples diagnosed with inguinal hernia at Nur Hidayah Hospital during the 2022–2023 period were analyzed. The majority of patients were male (91.9%; n = 41), while only 4 patients (8.1%) were female. In terms of age distribution, 34 patients (75.6%) were aged ≥45 years, indicating that older age may be a significant risk factor for inguinal hernia development.

Table 2
Test of Relationship Between Age and Inguinal Hernia

Age	Inguinal Hernia		Value p
	Lateral	Medialis	
<45	4	7	0,010
≥45	2	32	

Age distribution analysis revealed that older age is a significant risk factor for inguinal hernia development. The Chi-square test showed a p-value of 0.010 ($p < 0.05$), indicating a statistically significant relationship between age and inguinal hernia incidence.

Table 3
Test of Relationship Between Occupation and Inguinal Hernia

Work	Inguinal Hernia		Value p
	Lateral	Medialis	
Light	5	14	0,029
Medium-Heavy	1	25	

Regarding occupation, they were engaged in heavy labor which is a known risk factor for hernia development due to increased intra-abdominal pressure. The Chi-square test resulted in a p-value of 0.029 ($p < 0.05$), confirming a statistically significant association between occupation and inguinal hernia incidence. This result is in line with Erianto's research (2021), which found that more inguinal hernia patients at Pertamina Bintang Amin Hospital, Lampung, who are over 45 years old, total 65 patients with a percentage of 56.5% (Erianto et al., 2021).

This study employed an observational method with a cross-sectional research design to provide a snapshot of the prevalence and demographic characteristics of inguinal hernia cases at Nur Hidayah Hospital, Bantul. The non-probability purposive sampling method ensured the selection of relevant medical records, enhancing the study's validity (Ayhan, 2011). This approach effectively identified significant relationships between age, occupation, and the incidence of inguinal hernias, offering valuable insights for preventive strategies and healthcare policies.

In this study, it was found that the majority of inguinal hernia patients at Nur Hidayah Bantul Hospital were over 45 years old, namely 34 patients with a percentage of 75.6%. This is in line with the findings of Khan (2021), who stated that age has a relationship with the incidence of inguinal hernia, with a p-value of 0.010. This result is by the study conducted by Astuti in 2018, which examined the relationship between age and inguinal hernia and obtained a p-value of 0.004, indicating that there was a relationship between age and the incidence of inguinal hernia (Astuti, 2018)

The results of this study are also in line with the study conducted by Erianto (2021), which stated that there is a significant relationship between age and the incidence of inguinal hernia with a p-value of 0.033. From these results, it can be interpreted that the older a person is, the greater the possibility of experiencing an inguinal hernia (Erianto et al., 2021).

Age-related declines in bodily functions include the potential for the abdominal wall muscles to lose their capacity to support the organs. This suggests that the abdominal muscles' power may have started to wane in an elderly person, making them incapable of supporting the abdominal organs. Due to the abdominal muscles' incapacity to maintain them, the abdominal organs may protrude from the abdominal wall, which may result in abnormalities in the abdominal cavity that eventually develop into inguinal hernias. (Erianto et al., 2021).

In an elderly person, there is a change in the resistance of the transversal fascia which functions to withstand increased intra-abdominal pressure, which many things can cause. This change in the transversal fascia can be influenced by the condition of the collagen fibers that form the tissue and provide strength to the tissue. (Putri et al., 2023).

Based on the research conducted, the largest job category in inguinal hernia patients at Nur Hidayah Hospital is the moderate-heavy job category, which has 26 respondents (57.8%). Heavy activity can cause increased intra-abdominal pressure, which can be a major predisposition to inguinal hernia. If there is straining during physical activity, breathing will stop for a moment and cause the diaphragm to contract, increasing the depth of the thoracic cavity.

At the same time, the diaphragm and abdominal muscles can increase intra-abdominal pressure, pushing the abdominal contents into the inguinal canal and causing an inguinal hernia. (Sayuti & Aprilita, 2023). The study's results showed a p-value of 0.029, which means there is a relationship between occupation and the incidence of inguinal hernia at Nur Hidayah Hospital, Bantul.

A hernia is a protrusion of internal abdominal organs through a defect in the abdominal cavity. In jobs that require continuous abdominal muscle strength, such as lifting weights, the abdominal muscles are forced to work harder. If this is done frequently, it can cause the abdominal wall muscles to become weak and loose, allowing defects to occur in the abdominal muscles. This defect or gap later becomes a path for the internal abdominal organs to protrude, which is then referred to as an inguinal hernia. (Ramadhani et al., 2022).

Faridah's research (2019) showed similar results; there was a relationship between activity levels and the incidence of inguinal hernia at the Arafah Islamic Hospital in Rembang with a p-value of 0.011. Heavy activity can cause inguinal hernias. Inguinal hernias can occur due to protrusion through a cavity

or defect in the abdomen. This cavity can be formed from a weak part of the abdomen that continues to experience intra-abdominal pressure, allowing abdominal organs to protrude through it (Faridah et al., 2020).

CONCLUSION

This study confirms a significant relationship between age, occupation, and the incidence of inguinal hernia at Nur Hidayah Hospital. According to the results, those who are older (≥45 years) and work hard are more prone to get inguinal hernias, most likely due to aging muscles and frequent physical strain. The prevalence of medial inguinal hernias further supports the importance of degenerative alterations in abdominal wall integrity.

These findings emphasize how urgently preventive measures are needed, especially for high-risk populations. While early screening programs may help in the timely identification and management of hernias, workplace ergonomics, core-strengthening exercises, and appropriate lifting techniques can all help prevent occupational strain. To enhance patient outcomes and optimize prevention tactics, larger-scale research, and long-term follow-ups are advised going forward.

BIBLIOGRAPHY

Abebe, M. S., Tareke, A. A., Alem, A., Debebe, W., & Beyene, A. (2022). The worldwide magnitude of inguinal hernia: Systematic review and meta-analysis of population-based studies. *SAGE Open Medicine*, *10*, 20503121221139150.

Astuti, M. F. (2018). Hubungan antara Usia dan Hernia Inguinalis di RSUD dr. Soedarso Pontianak. *Jurnal Mahasiswa PSPD FK Universitas Tanjungpura*, *4*(2).

Ayhan, H. Ö. (2011). Non-probability Sampling Survey Methods. *International Encyclopedia of Statistical Science*, *14*, 979–982.

Bellad, A. P., & Pratap, K. A. (2018). Effectiveness of tissue adhesive versus conventional sutures in the closure of inguinal hernia skin incisions: a prospective randomized controlled trial. *International Surgery Journal*, *5*(5), 1797–1801.

Bikbov, B., Purcell, C. A., Levey, A. S., Smith, M., Abdoli, A., Abebe, M., Adebayo, O. M., Afarideh, M., Agarwal, S. K., & Agudelo-Botero, M. (2020). Global, regional, and national burden of chronic kidney disease, 1990–2017: a systematic analysis for the Global Burden of Disease Study 2017. *The Lancet*, *395*(10225), 709–733.

Burcharth, J., Pedersen, M., Bisgaard, T., Pedersen, C., & Rosenberg, J. (2013). Nationwide prevalence of groin hernia repair. *PloS One*, *8*(1), e54367.

Erianto, M., Futri, F. N., Triwahyuni, T., & Prasetia, T. (2021). Hubungan Usia dengan Jenis Hernia Inguinalis di RS Pertamina Bintang Amin Lampung: Relationship Age and The Type of Inguinal Hernia at Pertamina Bintang Amin Hospital. *Jurnal Ilmu Dan Teknologi Kesehatan Terpadu*, *1*(2), 73–79.

Faridah, U., Hartinah, D., & Nindiawaty, N. (2020). Hubungan Tingkat Aktifitas Dengan Hernia Di Rs Islam Arafah Rembang. *Jurnal Ilmu Keperawatan Dan Kebidanan*, *11*(1), 140–144.

He, C., Lu, J., Ong, M. W., Lee, D. J. K., Tan, K. Y., & Chia, C. L. K. (2020). Seroma prevention strategies in laparoscopic ventral hernia repair: a systematic review. *Hernia*, *24*, 717–731.

Jha, S. (2020). A study to assess the prevalence and risk factors of inguinal hernia. *International Journal of Surgery*, *4*(3), 330–332.

Kuijer, P., Hondebrink, D., Hulshof, C. T. J., & Van der Molen, H. F. (2020). Work-relatedness of inguinal hernia: a systematic review including meta-analysis and GRADE. *Hernia*, *24*(5), 943–950.

Li, Y., Tian, Z., Liu, C., Li, S., Bi, W., & Ji, Q. (2023). A nomogram prediction model for internal hernia using clinical parameters and non-enhanced computed tomography imaging. *Journal of*

Gastrointestinal Surgery, *27*(5), 998–1000.

Mabula, J. B., & Chalya, P. L. (2012). Surgical management of inguinal hernias at Bugando Medical Centre in northwestern Tanzania: our experiences in a resource-limited setting. *BMC Research Notes*, *5*, 1–8.

Melwani, R., Malik, S. J., Arija, D., Sial, I., Bajaj, A. K., Anwar, A., & Hashmi, A. A. (2020). Body mass index and inguinal hernia: An observational study focusing on the association of inguinal hernia with body mass index. *Cureus*, *12*(11).

Patel, V. (2018). Safety of direct trocar insertion in various gynecological laparoscopic surgeries. *Indian Journal of Obstetrics and Gynecology Research*, *5*(4), 485–488.

Peterman, N. J., Li, R. L., Kaptur, B. D., Yeo, E. G., Yang, D., Keita, P., & Carpenter, K. (2022). Evaluation of regional geospatial clusters in inguinal hernia repair. *Cureus*, *14*(6).

Putri, N. A., Agistany, N. F. F., Akhyar, R. B. F., Chauna, S., Annisa, W. N., & Haikal, Z. (2023). Inguinal Hernia: Diagnosis and Management. *Jurnal Biologi Tropis*, *23*(1), 96–103.

Ramadhani, A., Mustofa, F. L., Purnanto, E., & Syahriani, T. (2022). HUBUNGAN PEKERJAAN TERHADAP KEJADIAN HERNIA INGUINALIS DI RUMAH SAKIT PETAMINA BINTANG AMIN HUSADA PERIODE OKTOBER 2021–MARET 2022. *Jurnal Medika Malahayati*, *6*(3).

Riaz, S., Khan, N. A., Khalique, A., & Ramzan, R. (2023). A Study on Incidence of Inguinal Hernia about BMI. *Pakistan Journal of Medical & Health Sciences*, *17*(05), 444.

Sanjaya, C. E. (2023). Lateral inguinal hernia: A case report in a rural area. *International Journal of Health and Medical Sciences*, *6*(1), 44–46.

Sayuti, M., & Aprilita, R. (2023). Teknik Operasi Hernia Inguinalis Dan Faktor Risiko Hernia Inguinalis Residif Di 7 Rumah Sakit Perifer Di Aceh. *Jurnal Ilmu Kesehatan Dan Gizi*, *1*(3), 195–203.

Schlosser, K. A., Renshaw, S. M., Tamer, R. M., Strassels, S. A., & Poulose, B. K. (2023). Ventral hernia repair: an increasing burden affecting abdominal core health. *Hernia*, *27*(2), 415–421. https://doi.org/10.1007/s10029-022-02707-6

Vad, M. V., Frost, P., Bay-Nielsen, M., & Svendsen, S. W. (2012). Impact of occupational mechanical exposures on the risk of lateral and medial inguinal hernia requiring surgical repair. *Occupational and Environmental Medicine*, *69*(11), 802–809.

Van Silfhout, L., Staal, E., & Van Der Meer, S. B. (2022). A left-sided inguinoscrotal hernia mimicking a right-sided hernia: a case report. *Journal of Surgery and Trauma*, *10*(3), 122–124.

Vijayakumar, S., & Alagar, R. (2003). A study on incidence and risk factors of inguinal hernia in ESI population. *IOSR J Dent Med Sci*, *15*(7), 2279–2861.

Wismayer, R. (2021). Chronic Post-Inguinal Herniorrhaphy Pain in a Setting in Rural Africa. *Journal*

of Advances in Medicine and Medical Research, *33*(16), 53–58.