Jurnal Ilmu Kesehatan Vol. 12 No. 1 June 2024
E-ISSN : 2614-6703

Received : 2024-02-18 Revised : 2024-04-20 Accepted : 2024-06-07 Published : 2024-06-28

The Link Between Prolonged Sitting and UTIs: A Cross-Sectional Study of Bank Tellers in Tarakan, Indonesia

Abstract: Urinary tract infections (UTIs), which are common in humans, can be influenced by a lack of physical activity, as experienced by office workers, including bank employees, who tend to spend long periods sitting in front of desks and computers. The aim of this study was to determine the relationship between prolonged sitting and UTIs among Bank Employees in North Kalimantan, Tarakan City. This was an analytical observational study with a cross-sectional design. Data were collected using questionnaires from 64 subjects selected through random sampling. The results showed that 33 (48.4%) experienced UTIs. Prolonged sitting for ≥5 hours contributed to 44 subjects (68.8%). The chi-square test analysis showed a relationship between prolonged sitting and UTIs among Bank Employees in North Kalimantan, Tarakan City (p-value = 0.02). The conclusion of this study is that there is a relationship between prolonged sitting and UTIs among Bank Employees. To reduce the risk of UTIs, it is recommended that bank employees regularly stand or walk..

Keywords: Urinary tract infections, Prolonged sitting, Bank employees.

1. Introduction

Urinary tract infections (UTIs) are among the most common infections in humans, occurring when pathogenic microorganisms enter and proliferate in the urinary tract, including the bladder, urethra, and kidneys. UTIs can affect individuals of all ages, from newborns to the elderly, and are particularly prevalent in developing countries, ranking as the second most common infectious disease after respiratory tract infections. According to estimates from the Indonesian Ministry of Health, the number of UTI cases in Indonesia is 90-100 cases per 100,000 population per year, or about 180,000 new cases per year. In 2016, the Indonesian Ministry of Health reported that the frequency of UTIs in East Java reached 3-4 cases per 100,000 people per year.

Several factors can trigger UTIs, including anatomical, sexual, age-related, and physical activity factors (Hailay et al., 2020; Simões E Silva et al., 2020). Anatomical factors such as urinary tract obstructions, kidney stones, or structural abnormalities can predispose individuals to UTIs. Sexual factors, such as intense sexual activity, spermicide use, or changes in sexual partners, can also increase the risk of UTIs. Additionally, age-related factors, especially in women entering menopause, can influence UTI risk. The decrease in estrogen levels during menopause leads to changes in the vaginal wall that can increase the risk of UTIs (Anger et al., 2019; Irawan & Mulyana, 2018)

One of the risk factors for UTIs is lack of physical activity or prolonged sitting. A study by (Fowke et al., 2013) found that individuals with low physical activity levels were more likely to experience UTIs than those who were more physically active. Another study by (Mititelu et al., 2024) also showed that lack of physical activity can increase UTI risk in women. One group that may have insufficient physical activity is office workers, who often spend long hours sitting in

front of desks and computers, leading to various health problems (Demou et al., 2018). Employees typically sit for a staggering 10 hours a day at work, with half never even getting up during breaks. Prolonged sitting has been associated with various health risks, including musculoskeletal disorders, obesity, diabetes, cardiovascular disease, and even premature mortality. This sedentary behavior not only affects physical health but also has implications for mental well-being, such as increased stress and decreased mood. To mitigate these risks, it is crucial for employees to incorporate regular movement breaks into their daily routine, as even short bouts of physical activity can have significant health benefits (Bennie et al., 2016; Leu et al., 2023). One such group of office workers who spend long hours sitting at desks and computers are bank employees.

PT Bank Pembangunan Daerah Kalimantan Timur dan Kalimantan Utara, known as Bankaltimtara Branch Office Tarakan, is a regional government-owned enterprise owned by the East Kalimantan Provincial Government and the North Kalimantan Provincial Government. Like other bank employees, employees at Bankaltimtara's Tarakan branch spend considerable time sitting. As office workers, Bankaltimtara employees face a dilemma: they must focus on their work while also risking UTIs due to prolonged sitting. Therefore, research on the relationship between prolonged sitting and UTIs in Bankaltimtara employees is considered necessary.

Thus, a study on the relationship between sitting duration at work and UTI risk in bank employees can provide a better understanding of risk factors and help develop more effective prevention strategies..

2. Materials and Methods

This study is an analytical observational study. The research design used in this study is cross-sectional with a sample size of 64 bank employees. Informed consent was obtained from all research subjects. Sampling was conducted using simple random sampling technique. The research was conducted at Bankaltimtara Branch Office Tarakan. The study was approved by the Health Research Ethics Commission of the Faculty of Health Sciences, Borneo Tarakan University No.019/KEPK-FIKES UBT/VI/2023. The data collection was conducted in July-August 2023.

Data were collected by providing online questionnaires. The research instruments used were questionnaires about urogenital hygiene and urogenital health knowledge. The Workforce Sitting Questionnaire (WSQ) (Chau et al., 2011) was used to measure workers' sitting time and The UTI Symptom Assessment questionnaire (Clayson et al., 2005) was used to measure lower urinary tract symptoms in uncomplicated urinary tract infection (UTI The independent variable in this study was Prolonged Sitting (workers' sitting time), and the dependent variable was UTIs. The collected data were then analyzed using the chi-square statistical test to assess the relationship between the independent and dependent variables. The relationship between the dependent and independent variables was considered significant if the p-value was ≥ 0.05.

3. Results and Discussion

3.1 The result of the frequency distribution of characteristics of Bankaltimtara Employees in Tarakan City

In this study, there were 64 bank employees who volunteered to be respondents. The description of respondents includes age, gender, and length of employment (years) (Table 1).

Table 1. Frequency distribution of characteristics of Bankaltimtara Employees in Tarakan City.

Characteristics	Category	Frequency (f)	Percentage (%)
Age	20-25 Years	14	21,9
	26-30 Years	24	37,5
	>30 Years	25	39,1
	Total	**64**	**100**
Length of Employment	1-5 Years	28	43,9
	6-10 Years	19	29,7
	>10 Years	17	26,6
	Total	**64**	**100**
Gender	Female	42	65,6
	Male	22	34,4
	Total	**64**	**100**

Table 1 shows that out of 64 respondents, the majority of respondents were aged >30 years, which accounted for 25 respondents (39.1%). Based on the length of employment, the majority had worked for 1-5 years, totaling 28 respondents (43.9%). The characteristics of respondents based on gender showed that the majority were female, totaling 42 respondents (65.6%).

3.2 The result of the frequency distribution of the sitting time of Bankaltimtara employees in Tarakan City

Tabel 2 Frequency distribution of the sitting time of Bankaltimtara employees in Tarakan City

Category	Frequency (f)	Percentage (%)
≥5 hours	44	68,8
< 5 hours	20	31,3
Total	**64**	**100**

Table 2 shows the frequency distribution of the sitting time habits of Bankaltimtara employees, with the majority of the research subjects sitting for ≥5 hours, totaling 44 respondents (68.8%)

3.3 The result of the frequency distribution of urinary tract infection prevalence among Bankaltimtara employees in Tarakan City

Tabel 3 Frequency distribution of urinary tract infection prevalence among Bankaltimtara employees in Tarakan City

Urinary Tract Infection	Frequency (f)	Percentage (%)
Yes	33	48,4
No	31	51,6
Total	**64**	**100**

Table 3 shows the frequency distribution of urinary tract infection prevalence among Bankaltimtara employees in Tarakan City shows that the majority of respondents experienced UTIs, totaling 33 respondents (48.4%).

3.4 The result of the analysis on the relationship between sitting time habits and UTIs among Bankaltimtara employees in Tarakan City

For bivariate results of the relationship between between sitting time habits and UTIs among Bankaltimtara employees in Tarakan City can be seen in the table 4 below.

Tabel 4 The relationship between between sitting time habits and UTIs among Bankaltimtara employees in Tarakan City

Independent variable	Category	Dependent variable Urinary Tract Infection						*Coeffisient Correlation*	*P Value*
		Yes		No		Total			
		n	%	n	%	n	%		
sitting time	≥5 Hours	27	42,2	17	26,6	44	68,8	0,99	0,02
	< 5 Hours	6	9,4	14	21,9	20	31,3		

Based on table 4, the analysis results regarding the relationship between sitting time and UTIs among Bankaltimtara employees in Tarakan City show that out of 64 respondents, there were 27 respondents (42.2%) who sat for more than 5 hours and experienced UTIs, while there were 6 respondents (9.4%) who sat for less than 5 hours and experienced UTIs. The Chi-Square test result with a P-Value of 0.02 < 0.05 rejects the null hypothesis (Ho), indicating a relationship between sitting time habits and UTIs among Bankaltimtara employees in Tarakan City. The correlation coefficient value of 0.99 indicates a very strong positive correlation between sitting time and Urinary Tract Infection. It can be concluded that the longer a bank employee sits, the higher the risk of Urinary Tract Infection.

From 64 Bankaltimtara employees in Tarakan City, the majority of respondents are over 30 years old, indicating that older populations may be more vulnerable to UTIs due to factors such as

decreased immune function and hormonal changes (Evans, 2012) Additionally, the majority of respondents have been working for 1-5 years, which may suggest that longer work durations can increase the risk of UTIs due to prolonged sitting habits at work. The data indicates that employees who have been working in the office for more than 3 years tend to have a sedentary lifestyle, which can increase the risk of health problems. Prolonged sitting habits have been associated with various health risks, including obesity, type 2 diabetes, cardiovascular disease, and even cancer (Healy et al., 2011; Parry et al., 2013; Saidj et al., 2014). Respondent characteristics based on gender show that the majority are female, which is consistent with the finding that women are more prone to UTIs than men, as women's urethras are shorter and more easily contaminated by bacteria (Perez-Carrasco et al., 2021)

The frequency distribution of sitting habits indicates that the majority of research subjects sit for ≥5 hours, which aligns with the finding that excessive sitting can increase the risk of UTIs by disrupting urine flow and creating a more favorable environment for bacterial growth (Heyns, 2012) . This can be explained by several biological mechanisms (Flores-Mireles et al., 2015) , namely urine stasis, suppression of blood flow, and hormonal changes, which can explain the relationship between prolonged sitting habits and the risk of UTIs. Urine stasis occurs when prolonged sitting causes urine to pool in the bladder, creating an ideal environment for bacteria to multiply. Suppression of blood flow to the pelvic area due to prolonged sitting can reduce the body's ability to fight infections by reducing the supply of blood and nutrients to that area. Additionally, prolonged sitting can also affect estrogen hormone levels in women, which can increase susceptibility to UTIs. These mechanisms highlight the importance of awareness of good sitting habits to prevent the risk of UTIs (Foxman, 2014; Raz, 2011; Singh et al., 2020).

The analysis results indicate a significant relationship between sitting time and the incidence of urinary tract infections (UTIs) among Bankaltimtara employees in Tarakan City. Respondents who sit for more than 5 hours are at higher risk of experiencing UTIs compared to those who sit for less than 5 hours. The very strong positive correlation between sitting time and UTIs emphasizes the importance of paying attention to sitting habits in the workplace to prevent UTIs.

Research has shown that prolonged sitting can lead to blood flow stagnation in the pelvic area, which can promote bacterial growth and increase the risk of urinary tract infections. To prevent UTIs, employees are advised to schedule regular breaks, change sitting positions periodically, and increase physical activity during working hours. Short breaks every 30 to 60 minutes, such as standing, walking, or doing light stretching, can help improve blood circulation and prevent stagnation that can increase the risk of UTIs (Litterini & Wilson, 2021). Additionally, changing sitting positions periodically can also reduce pressure on the pelvic area and improve blood flow. It is recommended to change positions every 15-30 minutes, for instance, by using an ergonomic chair that supports position changes or using a standing desk for part of the workday(Cardenas et al., 2023; Tosun et al., 2022)

Light physical activity during working hours, such as short walks around the office, stretching, or light exercises at the desk, can be very beneficial. For example, a few minutes of walking each hour can help reduce the risk of various health problems, including UTIs (Lecky et al., 2020) Participation in corporate wellness programs that encourage physical activity, such as yoga classes or light exercise sessions at the workplace, can also be helpful (Kelly & Snow, 2019).

Implementing these strategies not only helps reduce the risk of UTIs but also enhances overall employee health and productivity. Organizations can support this by providing facilities that encourage physical activity, such as comfortable break rooms for stretching or basic fitness equipment in the office.

References:

4. Conclusion

In this study The analysis confirms a relationship between sitting time and UTIs, with those sitting over 5 hours at higher risk Prolonged sitting can lead to blood flow stagnation in the pelvic area, promoting bacterial growth and increasing the risk of urinary tract infections (UTIs). To prevent UTIs, employees should schedule regular breaks, change sitting positions periodically, and increase physical activity during working hours. Short breaks every 30 to 60 minutes, changing sitting positions every 15-30 minutes, and incorporating light physical activities like walking or stretching can improve blood circulation and reduce health risks. Implementing these strategies not only helps prevent UTIs but also enhances overall employee health and productivity.

Acknowledgements

Thank you to the Research and Community Service Institute (LPPM) of Borneo Tarakan University for funding this research, as well as to the respondents and others who have assisted in all the processes of this study..

References

Anger, J., Lee, U., Ackerman, A. L., Chou, R., Chughtaie, B., Clemens, J. Q., Hickling, D., Kapoor, A., Kenton, K., Kaufman, M., Rondanina, M. A., Santiago-Lastra, Y., Stapleton, A., Stothers, L., & Chai, T. (2019). Recurrent Uncomplicated Urinary Tract Infections in Women: AUA/CUA/SUFU Guideline (2022) - American Urological Association. *American Urological Association*, *December 2017*. https://www.auanet.org/guidelines/guidelines/recurrent-uti#x14261

Bennie, J. A., Pedisic, Z., van Uffelen, J. G. Z., Gale, J., Banting, L. K., Vergeer, I., Stamatakis, E., Bauman, A. E., & Biddle, S. J. H. (2016). The descriptive epidemiology of total physical activity, muscle-strengthening exercises and sedentary behaviour among Australian adults – results from the National Nutrition and Physical Activity Survey. *BMC Public Health*, *16*(1), 73. https://doi.org/10.1186/s12889-016-2736-3

Cardenas, D. A., Albert, D. W., Léger, M. C., Dion, C., & Cardoso, M. (2023). What are the

effects of implementing an active sitting protocol while using an active chair, compared to the use of a traditional office chair, and standing workstation. *Compared to the Use of a Traditional Office Chair, and Standing Workstation*.

Chau, J. Y., Ploeg, H. P. van der, Dunn, S., Kurko, J., & Bauman, A. E. (2011). A tool for measuring workers' sitting time by domain: the Workforce Sitting Questionnaire. *British Journal of Sports Medicine*, *45*(15), 1216 LP – 1222. https://doi.org/10.1136/bjsports-2011-090214

Clayson, D., Wild, D., Doll, H., Keating, K., & Gondek, K. (2005). Validation of a patient-administered questionnaire to measure the severity and bothersomeness of lower urinary tract symptoms in uncomplicated urinary tract infection (UTI): the UTI Symptom Assessment questionnaire. *BJU International*, *96*(3), 350–359. https://doi.org/https://doi.org/10.1111/j.1464-410X.2005.05630.x

Demou, E., MacLean, A., Cheripelli, L. J., Hunt, K., & Gray, C. M. (2018). Group-based healthy lifestyle workplace interventions for shift workers: a systematic review. *Scandinavian Journal of Work, Environment & Health*, *44*(6), 568–584. https://doi.org/10.5271/sjweh.3763

Evans, M. M. (2012). Urinary tract infection in older adults. *Nursing*, *42*(4), 72. https://doi.org/10.1097/01.NURSE.0000412932.50878.9c

Flores-Mireles, A. L., Walker, J. N., Caparon, M., & Hultgren, S. J. (2015). Urinary tract infections: epidemiology, mechanisms of infection and treatment options. *Nature Reviews. Microbiology*, *13*(5), 269–284. https://doi.org/10.1038/nrmicro3432

Fowke, J. H., Phillips, S., Koyama, T., Byerly, S., Concepcion, R., Motley, S. S., & Clark, P. E. (2013). Association between physical activity, lower urinary tract symptoms (LUTS) and prostate volume. *BJU International*, *111*(1), 122–128. https://doi.org/https://doi.org/10.1111/j.1464-410X.2012.11287.x

Foxman, B. (2014). Urinary tract infection syndromes: occurrence, recurrence, bacteriology, risk factors, and disease burden. *Infectious Disease Clinics of North America*, *28*(1), 1–13. https://doi.org/10.1016/j.idc.2013.09.003

Hailay, A., Zereabruk, K., Mebrahtom, G., Aberhe, W., & Bahrey, D. (2020). Magnitude and Its Associated Factors of Urinary Tract Infection among Adult Patients Attending Tigray Region Hospitals, Northern Ethiopia, 2019. *International Journal of Microbiology*, *2020*, 8896990. https://doi.org/10.1155/2020/8896990

Healy, G. N., Matthews, C. E., Dunstan, D. W., Winkler, E. A. H., & Owen, N. (2011). Sedentary time and cardio-metabolic biomarkers in US adults: NHANES 2003-06. *European Heart Journal*, *32*(5), 590–597. https://doi.org/10.1093/eurheartj/ehq451

Heyns, C. F. (2012). Urinary tract infection associated with conditions causing urinary tract obstruction and stasis, excluding urolithiasis and neuropathic bladder. *World Journal of Urology*, *30*(1), 77–83. https://doi.org/10.1007/s00345-011-0725-9

Irawan, E., & Mulyana, H. (2018). Faktor-Faktor Penyebab Infeksi Saluran Kemih (ISK). *Prosiding Seminar Nasional Dan Diseminasi Penelitian Kesehatan*, *April*, 1–12.

Kelly, R. K., & Snow, S. (2019). The importance of corporate wellness programs for psychological health and productivity in the workplace. In *Creating Psychologically Healthy Workplaces* (pp. 411–430). Edward Elgar Publishing.

Lecky, D. M., Howdle, J., Butler, C. C., & McNulty, C. A. M. (2020). Optimising management of UTIs in primary care: a qualitative study of patient and GP perspectives to inform the development of an evidence-based, shared decision-making resource. *British Journal of*

General Practice, *70*(694), e330–e338.
Leu, J., Rebello, S. A., Sargent, G. M., Kelly, M., & Banwell, C. (2023). Hard work, long hours, and Singaporean young adults' health-A qualitative study. *Frontiers in Public Health*, *11*, 1082581. https://doi.org/10.3389/fpubh.2023.1082581
Litterini, A. J., & Wilson, C. M. (2021). Management of Conditions and Symptoms. In *Physical Activity and Rehabilitation in Life-threatening Illness* (pp. 211–248). Routledge.
Mititelu, M., Olteanu, G., Neacșu, S. M., Stoicescu, I., Dumitrescu, D. E., Gheorghe, E., Tarcea, M., Busnatu, Ștefan S., Ioniță-Mîndrican, C. B., Tafuni, O., Belu, I., Popescu, A., Lupu, S., & Lupu, C. E. (2024). Incidence of Urinary Infections and Behavioral Risk Factors. *Nutrients*, *16*(3). https://doi.org/10.3390/nu16030446
Parry, S., Straker, L., Gilson, N. D., & Smith, A. J. (2013). Participatory workplace interventions can reduce sedentary time for office workers--a randomised controlled trial. *PloS One*, *8*(11), e78957. https://doi.org/10.1371/journal.pone.0078957
Perez-Carrasco, V., Soriano-Lerma, A., Soriano, M., Gutiérrez-Fernández, J., & Garcia-Salcedo, J. A. (2021). Urinary Microbiome: Yin and Yang of the Urinary Tract. *Frontiers in Cellular and Infection Microbiology*, *11*(May), 1–17. https://doi.org/10.3389/fcimb.2021.617002
Raz, R. (2011). Urinary tract infection in postmenopausal women. *Korean Journal of Urology*, *52*(12), 801–808. https://doi.org/10.4111/kju.2011.52.12.801
Saidj, M., Jørgensen, T., Jacobsen, R. K., Linneberg, A., & Aadahl, M. (2014). Differential cross-sectional associations of work- and leisure-time sitting, with cardiorespiratory and muscular fitness among working adults. *Scandinavian Journal of Work, Environment & Health*, *40*(5), 531–538. https://doi.org/10.5271/sjweh.3443
Simões E Silva, A. C., Oliveira, E. A., & Mak, R. H. (2020). Urinary tract infection in pediatrics: an overview. *Jornal de Pediatria*, *96 Suppl 1*(Suppl 1), 65–79. https://doi.org/10.1016/j.jped.2019.10.006
Singh, V., Wilks, C., Reddy, J., & Granger, J. (2020). Outpatient Urinary-Tract-Infection-Like Symptoms: Causative Microbial Survey Utilizing Multiplex Quantitative Polymerase Chain Reaction Methodology. *Advances in Infectious Diseases*, *10*(01), 26–36. https://doi.org/10.4236/aid.2020.101003
Tosun, Ö. Ç., Dayıcan, D. K., Keser, İ., Kurt, S., Yıldırım, M., & Tosun, G. (2022). Are clinically recommended pelvic floor muscle relaxation positions really efficient for muscle relaxation? *International Urogynecology Journal*, *33*(9), 2391–2400.