

# Prevalence of non-Communicable Disease Risk Factors Among University Employees: A Cross-Sectional Study

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**Keywords:** Non-Communicable Disease, Risk Factor, Hypertension, Obesity, Hyperglycaemia.

**Abstract:** The prevalence of non-communicable diseases (NCDs) demonstrates an upward trend. Metabolic syndrome, characterized by high blood pressure, obesity, hyperglycaemia, and abnormal cholesterol, serves as a crucial indicator of associated risk factors for various NCDs. Current lifestyle patterns and high stress levels have been identified as the main contributors to this growing trend. This study aims to analyse the presence of NCDs risk factors among staff and lecturers at a private university in Aceh. A cross-sectional study was conducted at the private university clinic in Banda Aceh, involving a sample of 109 participants. Convenience sampling was employed by disseminating information to all university members regarding NCDs screening. Data analysis was performed using SPSS version 26 for univariate approach. The research was conducted between 24 and 28 June 2023. Results indicate that among the participants, 76.1% were aged 26-45, 63.3% were female, 82.6% were married, and 77.1% had worked for over 5 years. Hypertension was reported by 15.6%, while 25.7% had prehypertension. Obesity affected 65.1%, with 11.9% classified as overweight. Central obesity was prevalent in 70.6%, and 17.4% displayed hyperglycaemia. Additionally, 58.3% experienced medium to high stress, 45% had a family history of NCDs, 34.8% were smokers, 50.5% had irregular exercise, and 47.7% lacked sufficient fiber in their diet. This study highlights the prevalence of various NCD risk factors among university employees. The findings serve as a basis for further research in similar populations, involving a larger sample size, emphasizing comprehensive interventions like education, behaviour change and the university's attention to employee health highlights the necessity of a health-promoting university approach to support the wellbeing of university staff.

## 1 INTRODUCTION

Non-communicable diseases (NCDs) are experiencing an upward trend worldwide, with their prevalence being notably higher in Lower and Middle Income Countries (LMICs), including Indonesia (Ndubuisi, 2021). According to WHO (2022), NCDs cause the deaths of 41 million people annually, accounting for 74% of global deaths (World Health Organization, 2022). Among these, 17 million people died from NCDs prematurely, before reaching the age of 70, and a substantial 86% of these premature deaths occur within LMICs (World Health Organization, 2022). The five most prevalent NCDs comprise cardiovascular diseases, diabetes, preventable cancers, chronic respiratory diseases, and mental health conditions (World Health

Organization, 2022). In Indonesia, according to the Basic Health Research of 2018, the prevalence of NCDs is approximately 10% (Arifin et al., 2022). The primary contributing factor with the highest odds is depression, followed by other factors such as lack of education, passive smoking, female gender, poor diet, urban residence, and obesity (Arifin et al., 2022).

Metabolic syndrome, characterized by high blood pressure, obesity, hyperglycaemia, and abnormal cholesterol levels, stands as a crucial indicator of the linked risk factors for a range of NCDs especially heart disease, stroke and diabetes (American Heart Association, 2021). Additionally, Current lifestyle patterns and high stress levels have also been identified as the main contributors to this growing trend of high NCDs prevalence (American Heart Association, 2021).

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Meanwhile, various studies indicate a high prevalence of NCDs among lecturers and staff, identifying them as a high-risk population (Brenyah et al., 2023; Kuruvilla et al., 2023; Que, 2023). These studies have extensively observed and analysed health issues within this population, with a focus on diseases such as cardiovascular diseases, diabetes, chronic respiratory diseases, and others. These findings depict that the group of lecturers and staff is identified as a population with a higher risk of NCD occurrence (Alzeidan et al., 2016; Brenyah et al., 2023; Kuruvilla et al., 2023; Que, 2023).

Certain factors such as high work pressure, unhealthy eating patterns, as well as a less active lifestyle and limited time for physical activities, often characterize the work environment within academic settings (Fountaine et al., n.d.; Lima et al., 2021). These aspects can contribute to the elevated prevalence of NCDs among lecturers and staff. Therefore, a deep understanding of these risks will provide a crucial foundation for designing health programs specifically tailored to this group. Through a more targeted approach, the potential to reduce NCD risks among lecturers and staff can be enhanced, thus improving their well-being and productivity within the academic environment.

The primary objective of this research is to assess the prevalence of risk factors associated with Non-Communicable Diseases (NCDs) among the staff and lecturers of a private university in Aceh. This includes an examination of the presence of metabolic syndrome, encompassing risk factors such as hypertension, hyperglycaemia, overweight, and obesity. Additionally, the study will also investigate the prevalence of other lifestyle-related risk factors, including smoking, a diet low in fiber, and limited physical activity.

## 2 METHODS

The cross-sectional study was conducted with a sample of 109 participants at the private university clinic in Banda Aceh. Data analysis was performed using SPSS version 26 with a univariate approach and the research findings are presented descriptively to provide a comprehensive overview of the collected information. The research took place between June 24 and June 28 2023. Data collection involved conducting interviews using an online questionnaire through Google Forms and performing assessments such as body weight, height to calculate Body Mass Index (BMI), as well as other evaluations including abdominal circumference, blood pressure, and blood

glucose levels. For data collections, 41 students from the Public Health study program, along with a general practitioner and a nurse, participated as data collectors, responsible for measurements under the supervision of the researcher. Prior to the data collection, respondents were queried about their willingness to undergo NCDs screening and participate in the study.

## 3 RESULTS

Focusing on the characteristics of the respondents, out of the 109 staff and lecturers who engaged in the study, a significant majority, 76.1% were within the age range of 26 to 45 years, thereby classified as middle-aged adults. Furthermore, 63.3% of the participants were female, and 82.6% were married. Specifically, 44% comprised staff members exclusively, while 29.4% were lecturers only, and 26.6% held dual roles as both staff and lecturers, and 77.1% had over 5 years of work experience (Table 1).

Table 1: Characteristic of Respondents.

Characteristic	N	%
<b>Age group</b>		
Young adult	2	1.8
Middle-aged adult	83	76.1
Pre-elderly	21	19.3
Elderly	3	2.8
<b>Sex</b>		
Female	69	63.3
Male	40	36.7
<b>Marital status</b>		
Unmarried	17	15.6
Married	90	82.6
Divorce	2	1.8
<b>Employment status</b>		
Lecturer	32	29.4
Staff	48	44
Lecturer + staff	29	26.6
<b>Employment period</b>		
< 5 years	25	22.9
≥ 5 years	84	77.1
Total	109	100

According to the results of the univariate analysis focusing on the identification of risk factors for NCDs, some of these variables encompass the concept of metabolic syndrome. The findings reveal that 15.6% of the participants demonstrated elevated blood pressure, which corresponds to the

classification of hypertension. Moreover, 25.7% exhibited prehypertension. Furthermore, the study identified that 65.1% were categorized as obese, and 11.9% were classified as overweight. The assessment of abdominal circumference unveiled central obesity as prevalent among 70.6% of the participants, while 17.4% displayed signs of hyperglycaemia. Additionally, it was observed that 58.3% of the respondents reported a medium to high stress level. Approximately 45% of the respondents had a family history of NCDs, encompassing conditions such as diabetes, cardiovascular disease, or stroke. Additionally, 38.4% of the participants were either active or passive smokers, with over half admitting to irregular exercise patterns. Furthermore, nearly half of the participants reported an insufficient intake of dietary fiber (Table 2).

Table 2: The Prevalence of NCDs Risk Factor.

Assessment	Category	N	%
Blood pressure	Hypertension	17	15.6
	Pre-hypertension	28	25.7
	Normal	64	58.7
Body mass index	Obesity	71	65.1
	Overweight	13	11.9
	Normal	18	16.5
Abdominal circumference	Underweight	6	5.5
	Abnormal (central obese)	77	70.6
	Normal	32	29.4
Blood glucose level	Hyperglycaemia	19	17.4
	Normal	90	82.6
Stress level	High	10	9.2
	Medium	53	48.6
	Low	46	42.2
Family history of NCDs	Present	49	45
	Absent	60	55
Smoking	Active	12	11
	Passive	31	28.4
	Non-smoker	66	60.6
Exercise	Irregular	55	50.5
	Regular	54	49.5
Regular fiber-based diet	Insufficient	52	47.7
	Sufficient	57	52.3
Total		109	100

## 4 DISCUSSION

Based on research results, the prevalence of risk factors for non-communicable diseases (NCDs)

among university employees are concerning, particularly focusing on metabolic syndrome and associated variables. The obtained findings provide valuable insights into the health status and risk profiles of university employees.

Regarding blood pressure, the study revealed that a notable proportion, 15.6%, exhibited elevated blood pressure, which aligns with the classification of hypertension. Additionally, 25.7% demonstrated prehypertension, indicating a concerning predisposition to high blood pressure.

Globally, approximately 1.28 billion individuals aged 30 to 79 years suffer from hypertension, with around 46% of adults with this condition being unaware of their health status (World Health Organization, 2023). The diagnosis and treatment rates for hypertension are inadequate, underscoring the importance of regular blood pressure screening for early detection. Furthermore, the study's findings reveal that about a quarter of the respondents exhibited pre-hypertension. Prehypertension serves as an indicator that an individual could develop elevated blood pressure later on (Bruce, 2023). Positioned between normal blood pressure and hypertension, prehypertension is linked to sub-clinical atherosclerosis and damage to target organs (Anshuman Srivastava; Taaha M. Mirza; Shweta Sharan, 2022). Therefore, it is crucial to alert individuals with prehypertension and effectively manage this condition to maintain blood pressure within a healthy range.

Several studies show that the rate cases of elevated blood pressure is quite high, a research in Pattimura University, Indonesia examined 517 lecturers and staff members, revealing that the prevalence of stage 1 hypertension was 36%, while stage 2 hypertension accounted for 30%. Additionally, prehypertension was identified in 22% of the participants (Que, 2023). Another study conducted in a university setting reveals that the prevalence of hypertension among employees is 17% (Kuruville et al., 2023).

Obesity and central obesity emerged as another significant risk factor. 65.1% falling into obesity and 11.9% classified as overweight. This underscores the need for proactive measures to address obesity and its potential consequences, such as cardiovascular diseases and diabetes. The assessment of abdominal circumference exposed the prevalence of central obesity among 70.6% of participants, further highlighting the urgency of addressing this crucial risk factor for various NCDs. Some research also mentioned similar findings, indicating that the prevalence of obesity reached 50%, overweight

reached 16.8%, and central obesity reached 64.4% (Kuruvilla et al., 2023).

Concurrently, 17.4% of participants displayed signs of hyperglycaemia, accentuating the risk of diabetes. A similar finding was observed in a study that focused on the level of blood glucose among university employees, where 19% exhibited hyperglycaemia. (Que, 2023). Another study, which did not directly measure respondents' blood sugar levels but instead asked them about their satisfaction with their blood sugar levels, found that 47.5% of respondents reported dissatisfaction. This suggests that the results could potentially indicate abnormal levels (Brenyah et al., 2023).

Psychosocial aspects were also considered, with 58.3% of respondents reporting medium to high stress levels. In line with these findings, a study that examined the occurrence of work-related stress among university staff discovered an overall prevalence of 60.4% over a 12-month period. The study also identified correlated factors such as high job demands and low job control (Kabito GG, Wami SD, Chercos DH, 2020). Some studies have extensively documented the connections between psychosocial stressors and various illnesses (Ghosh & Verma, 2018; Marmot, 1999; Marmot MG, Bosma H, Hemingway H, Brunner E, 1997). Research has revealed that men with lower socioeconomic status face an increased likelihood of experiencing coronary heart disease (CHD) (Marmot MG, Bosma H, Hemingway H, Brunner E, 1997). Additionally, insufficient perceived job control and workplace stress have been identified as significant factors contributing to the development of conditions like CHD and hypertension (Cranny CJ, Smith PC, 1991). This connection between stress and NCDs is well-documented and underscores the importance of holistic health promotion strategies.

Another finding related to risk factors of NCDs include family history that played a significant role, as approximately 45% of participants reported a family history of NCDs. This emphasizes the genetic predisposition and the importance of tailored interventions for high-risk individuals. Meanwhile, lifestyle factors were also evident, with 38.4% of participants being active or passive smokers, more than half having irregular exercise patterns, and based on dietary habits, it were also addressed, as nearly half of the participants reported insufficient dietary fiber intake. These behaviors contribute to NCD risk and should be targeted in health promotion efforts, underscoring the importance of regular exercise and balanced diet in NCD prevention.

## 5 CONCLUSION

In conclusion, the research findings highlight the alarming prevalence of NCD risk factors among the employees, including high blood pressure, obesity, hyperglycemia, stress, smoking, lack of exercise and an insufficient fiber diet. The results emphasize the urgent need for comprehensive interventions to address these risk factors and promote healthier lifestyles, including multi approach encompassing education, behavioral changes, and policy initiatives is essential to limit the growing burden of NCDs in the population. The findings serve as a basis for further research in similar populations, involving a larger sample size. It emphasizes the importance of the university's awareness of employee health and the need for a health-promoting university approach to support the wellbeing of university staff.

However, this study has its limitations. It was integrated with a project-based learning activity, involving a significant number of enumerators, over 41 data collectors. Despite comprehensive training, potential biases in data collection cannot be disregarded. Moreover, due to time constraints for data collection, the study was unable to gather comprehensive data from all employees.

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