Determinants of the incidence of non-communicable diseases and early death among lecturers at the Health Polytechnic, Ministry of Health, Jambi

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Abstract

Background: Non-communicable diseases (NCDs) that cause early death both in the general population and among lecturers are increasing. This study aimed to analyze factors related to NCDs, as well as early death among lecturers.

Method: This study design was cross-sectional. The sample was 4 lecturers who died in the 2013-2022 period to identify causes of early death and 75 homebase lecturers for NCDs incidents at the Jambi Ministry of Health Polytechnic.

Results: The number of early deaths was 4 people (1.75 person-years) and the incidence of NCDs was 17.3%. Factors associated with NCDs were workload (PR= 8.25; 95% CI= 1.96-34.61), family history (PR= 4.50; 95% CI= 1.83-11.05), stress (PR= 3.98; 95% CI=1.54-10.26) and rest patterns (PR 3.61; 95% CI 1.32-9.87). There was no relationship between diet and physical activity and the incidence of NCDs. The dominant factor was workload after controlling by family history, diet, rest patterns and stress (PR= 5.127; 95% CI=1.02-25.60).

Conclusion: Lack of rest, family history, stress and workload increase the risk of NCDs and early death in lecturers. The lecturers must pay attention to their workload, implement a balanced nutritional diet, rest patterns, and stress management, especially for those with a family history of NCDs to prevent NCDs and early death.

Keywords: NCDs; Hypertension; Diabetes Mellitus; Lecturer; early death.

INTRODUCTION

Non-communicable diseases (NCDs) are a major health burden in developed countries as well as advanced industrial countries. There are five NCDs with very high morbidity and mortality in Southeast Asia, namely heart (cardiovascular) disease, diabetes mellitus (DM), cancer, chronic obstructive respiratory disease, and illness due to accidents. NCDs is one of the world's and Indonesia's health problems which is of global concern because it is one of the main causes of death in the world (1).

NCDs account for 41 million (71%) deaths worldwide. The proportion of deaths due to NCDs in Indonesia is estimated at 73%, of which 35% are due to cardiovascular disease, 12% due to cancer, 6% due to DM and 6% due to chronic respiratory disease. NCDs also kill young populations, in low- and middle-income countries. Among all deaths that occur in people under the age of 60 years old, 29% are caused by NCDs.

Therefore, NCDs are often associated as a cause of early death (2).

The results of basic health research in Indonesia in 2018 showed that the prevalence of NCDs had increased compared to the 2013 result. The prevalence of cancer increased from 1.4% to 1.8%, stroke increased from 7% to 10.9%, and chronic kidney disease increased from 2% to 3.8%. DM increased from 6.9% to 8.5% and hypertension also increased from 25.8% to 34.1% (3,4).

Hypertension is a risk factor for death and the third rank in the world. WHO reports that 70% of total deaths in the world and more than half of the disease burden, 90 – 95% of diabetes cases, most of which are preventable, are caused by unhealthy lifestyles. Based on 2021 International Diabetes Federation (IDF) data, Indonesia has diabetes alert status because it ranks 7th out of 10 countries with the highest number of diabetes patients. The prevalence

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of patients with diabetes in Indonesia reached 6.2%, which means that more than 10.8 million people suffered from diabetes per year in 2020 (5).

The most common causes of NCDs are unhealthy eating patterns, lack of physical activity, exposure to tobacco smoke, alcohol use, workload, rest patterns, stress, eating patterns, family history, and unhealthy behavior (6). Workers who have more risk of workload are the lecturers. Apart from that, the level of well-being obtained is not commensurate with work demands, resulting in work patterns with heavy loads that give rise to NCDs such as diabetes mellitus and hypertension. Lecturers are one of the dominant components in the education system that determines whether a higher education institution will advance in the academic field and make a major contribution to educating the next generation of quality (7).

The obligation to carry out the Tri Dharma of higher education (teaching, research, and community services) causes the lecturers to always work more than their normal working hours and have to work better every day because of performance demands. Many lecturers use their rest time for work, even on weekends, so they don't have time to do physical activity and adopt poor eating patterns. Lecturers are vulnerable to stress due to work because of the responsibilities and demands of lecturers' multitasking work, such as guiding students, carrying out learning both in the classroom and in the field for practice, conducting research and community services, as well as compiling materials or textbooks and compiling scientific publications routinely (8).

The results of Kalsum, et al research on lecturers at Universitas Jambi found that the cause of early death among lecturers was non-communicable diseases (NCDs) at about 96%, especially DM at 28%, as well as heart disease, hypertension, liver cancer and auto-immune. The causal factors were unhealthy eating patterns, lack of physical activity, and rest patterns. Factors that were closely related to the incidence of early death due to NCDs among lecturers were age, length of service, rank, rest patterns, and physical activity. A long period of work as a lecturer (30 years or more) was the dominant factor in increasing the risk of early death due to NCDs among lecturers in Jambi (9).

Research that reveals the factors causing NCDs and early death in lecturers is still very limited and has never even been carried out in health education institutions such as the Health Polytechnic. This research aimed to obtain an overview of the incidence of early death and the incidence of NCDS and to analyze the factors related to the incidence of NCDS and early death among lecturers at the Health Polytechnic.

METHOD

This study design was cross-sectional, data collection was carried out from July to August 2023 at the Indonesian Ministry of Health's Health Polytechnic, Jambi. There were two dependent variables in this research, namely early deaths that occurred in the last 10 years (2013 to 2022) and the incidence of non-communicable diseases (NCDs) among lecturers. Early death is defined as death that occurred before the lecturer was 60 years old (before elderly age) during the last 10 years, namely 4 people. Data was obtained from the General and Personnel Section (BAUK) of the Health Polytechnic of the Ministry of Health in Jambi and in-depth interviews with the closest family or closest friends of the lecturer who died with the criteria of being willing to become an informant regarding the cause of the lecturer's death and the characteristics of the lecturer such as age, gender, time of death and period work as a lecturer.

The dependent variable for the incidence of NCDs was measured by assessing the incidence of DM or Hypertension based on the diagnosis of health workers using a questionnaire and confirmed by measuring blood sugar levels and blood pressure using a digital measuring instrument. Measurements were carried out by nursing graduates from Universitas Jambi who had been trained before data collection was carried out. The respondent is declared to be suffering from hypertension if the blood

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pressure measurement results are systolic pressure >= 140 mmHg and diastolic pressure >= 90 mmHg. The respondent is declared to be suffering from DM if the results of the blood sugar measurement are >= 200 mg/dl.

The independent variables studied were workload, work stress, rest patterns, eating patterns, physical activity, and family history. Lecturers' workload and rest patterns were measured using interviews based on a questionnaire developed by previous research by Kalsum et al, 2021 (9). The workload is said to be heavy if the credit load per semester is > 16 credits, the workload is medium if the credit load is between 12-16 credits, and low if < 12 credits per semester. Lecturers' rest patterns were grouped into adequate rest if the duration of sleep at night is at least 7 hours/day and said to be insufficient or poor rest if they sleep < 7 hours/day. Meanwhile, work stress is measured using a standard questionnaire, as well as physical activity is measured using the GPAQ (Global Physical Activity Questionnaire) with an indicator of MET > 3000 categorized as heavy activity, MET between 600-3000 and light activity if MET < 600. A diet with indicators of adequate consumption of vegetables and fruit using FFQ (Food Frequency Questionnaire).

The research population was home-based lecturers active in 2023 at the Jambi Ministry of Health Polytechnic, totaling 126 people spread across 7 existing departments, namely nursing, midwifery, environmental health, dental nursing, health analysis, pharmacy. and health promotion. The inclusion criteria in this study were active lecturers at the Indonesia Ministry of Health's Health Polytechnic in Jambi in 2023, had worked as lecturers at the Jambi Ministry of Health's Health Polytechnic for at least 3 years when the survey was conducted, namely 117 people, while the exclusion criteria were lecturers who were suffering from illness, and it was not possible to be interviewed or measured, were carrying out study assignments, and refused to be interviewed and measured, namely 42 lecturers (response rate of this study was

64%). The sampling technique was the total sample, but according to the inclusion and exclusion criteria, the data obtained were 75 lecturers. Data analysis was carried out univariate, looking at the frequency distribution and for numerical data using the mean, median, minimum, and maximum (range) values. Bivariate analysis using the Chi-square test and multivariate analysis using Cox Regression, at a confidence level of 95%.

RESULTS

In this study, respondents who came from families of lecturers who had died, all refused to be interviewed, so researchers could not carry out an analysis of the causes of early death that included a description of workload, stress, family history, eating patterns, rest patterns and physical activity with the incidence of death. early childhood originating from his immediate family. However, the characteristics and causes of death were only obtained from secondary data originating from BAUK Health Polytechnic, Ministry of Health, Jambi.

The proportion of deaths among lecturers at the Jambi Ministry of Health Polytechnic in the last 10 years (2013 to 2022) among home base lecturers was 3.17% (4 people out of 126). There was one death each from the departments of midwifery, nursing, dental nursing, and environmental health. The characteristics of the lecturers who died were 75% men, and the average age of the lecturers who died was 57 years (minimum age 54 years and maximum age 59 years). The average tenure of lecturers who died was 28 years (between the range of 24 to 32 years). The average functional position of lecturers who experience death is Associate Professor. So far, the functional position of the existing lecturers is Associate Professor (there are no lecturers with the functional position of Full Professor). The cause of early death in lecturers was 100% due to NCDs including hypertension and DM, hypertension and heart disease, liver dysfunction, and cervical cancer. Died in 2013 (2 people) and 1 lecturer died in 2015 and 2020. The

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incidence rate of oferaly death among lecturers at the Jambi Ministry of Health Polytechnic for 2013-2022 was 1.75 per 100 person-years (Figure 1).
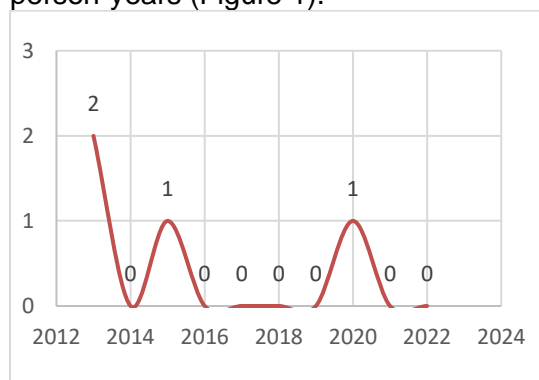

Figure 1. Number of deaths of lecturers at the Jambi Ministry of Health Polytechnic

Description of the characteristics of lecturers at the Health Polytechnic of the Ministry of Health in Jambi, most of whom were >= 40 years old, there were more women than men, they were married, and most household members were <= 4 people. Most do not have dependents outside the nuclear family, reaching 80%. Above half have worked as lecturers < 20 years (52%). Most of the functional positions were lecturers reached 56% and 53.3% do not carry out additional duties with a master's degree reached 97.3% where most earn >= Rp. 10,000,000/month. Most lecturers do not have a family history of NCDs (84%), 69.3% of lecturers with adequate rest patterns, but most with poor eating patterns reach 76%. Most lecturers do not experience stress, but there were 23% who experience work stress. The physical activity of most lecturers was high, reaching 81.3%, but the workload of lecturers was between moderate and heavy with the proportion of heavy workload reaching 40%, there were no lecturers with a light workload. The proportion of NCDs incidents among lecturers at Health Polytechnics with indicators of hypertension and diabetes mellitus reached 17.3% (Table 1).

Table 1. Lecturer Characteristics, Proportion of NCDs Incidence and Several NCDs Risk Factors among Lecturers at the Ministry of Health Jambi Health Polytechnic in 2023 (n=75)

Variables	n	(%)
Age		
< 40 years-old	11	14.7
≥ 40 years-old	64	85.3
Sex		
Male	24	32.0
Female	51	68.0
Marital status		
Not Married	4	5.3
Married	70	93.3
Divorce by death	1	1.3
Family member		
≤ 4 persons	50	66.7
> 4 persons	25	33.3
Number of Children		
≤ 2 children	51	68.0
> 2 children	24	32.0
Dependents outside of nuclear family	60	80.0
None	15	20.0
≥ 1 person		
Working period as lectures		
< 20 years	39	52.0
≥ 20 years	36	48.0
Fungtional Position		
Assistant Prof. (AA)	25	33.3
Assistant Prof. (Lektor)	42	56.0
Associate Prof. (LK)	8	10.7
Additional Duties		
No	40	53.3
Yes	35	46.7
Education Level		
Master	73	97.3
Doctoral	2	2.7
Income		
< Rp. 10,000,000	13	17.3
≥ Rp. 10,000,000	62	82.7
NCD's Family History		
Yes	12	16.0
No	63	84.0
Rest Pattern		
Poor	23	30.7
Enough	52	69.3
Eating Pattern		
Poor	57	76.0
Good	16	24.0
Work Stress		
Yes	17	22.7
No	58	77.3
Phiysical Activity		
Low	2	2.7
Moderate	12	16.0
High	61	81.3
Workload		
Heavy	30	40.0
Moderate to low	45	60.0
Non Communicable Diseases		
Yes	13	17.3
No	62	82.7

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Factors associated with the incidence of NCDs (Hypertension and Diabetes Mellitus) in Jambi Ministry of Health Polytechnic lecturers were family history (Prevalence Ratio (PR) = 4.50; 95% Confidence Interval (CI) = 1.83-11.05; P-value = 0.004), rest patterns (PR = 3.62; 95% CI = 1.33-9.87; P-value = 0.012), stress (PR = 3.98; 95% CI = 1.54-10.26; P-value = 0.007) and workload (PR = 8.25; 95% CI = 1.97-34.62; P-value = 0.001). Lecturers who have a family history increase their risk of developing NCDs by 4.5 times greater than those who do not have a family history.

Lecturers whose rest patterns were poor are at greater risk of developing NCDs than lecturers whose rest patterns are good. Lecturers who experience stress were almost 4 times more likely to suffer from NCDs than lecturers who do not experience stress. Lecturers with a heavy workload (> 16 credits/semester) are at greater risk of suffering from NCDs (Hypertension and DM) than lecturers with a moderate/light workload. Meanwhile, lecturers' diet and physical activity have not been proven to be related to the incidence of NCDs (Table 2).

Table 2. The Relationship of Several Risk Factors with the Incidence of Non-Communicable Diseases among Lecturers at the Jambi Health Polytechnic of the Ministry of Health, 2023

Variables	NCDs				PR	(95% CI)	P-Value
	Yes	%	No	%			
Family History							
Yes	6	50.0	6	50.0	4.50	(1.83-11.05)	0.004
No	7	11.1	56	88,9		Ref.	
Rest Pattern							
Poor	8	34.8	15	65.2	3.62	(1.33-9.87)	0.012
Enough	5	9.6	47	90.4		Ref.	
Eating Pattern							
Poor	8	14.0	49	86.0	0.51	(0.19-1.35)	0.161
Good	5	27.8	13	72,2		Ref.	
Work Stress							
Yes	7	41.2	10	58.8	3.98	(1.54-10.26)	0.007
No	6	10.3	52	89.7		Ref.	
Phisical Activity							
Low	1	50.0	1	50.0	3.05	(0.39-23.83)	0.565
Moderate	2	16.7	10	83.3	1.02	(0.22-4.64)	0.288
High	10	16.4	51	83.6		Ref.	0.983
Workload							
Heavy	11	36.7	19	63.3	8.25	(1.97-34.62)	0.001
Moderate to low	2	4.4	43	95.6		Ref.	

Source: Primary Data, 2023

Table 3. The Final Model of Determinants of Non Communicable Diseases among Lecturers

Variables	B	PR (95% CI)	P-value	P-value Omnibus
Workload	1.635	5.12 (1.02-25.60)	0.107	
Work Stress	0.665	1.94 (0.61-6.15)	0.259	
Family History	0.900	2.46 (0.72-8.35)	0.149	0.000
Eating Pattern	-0.298	0.74 (0.22-2.49)	0.631	
Rest Pattern	1.092	3.91 (0.74-20.58)	0.068	

Source: Primary Data, 2023

The results of a multivariate analysis of the causes of NCDs among lecturers in the Jambi Ministry of Health Polytechnic were workload, work stress, family history, eating patterns, and rest patterns. The dominant factor in the incidence of NCDs in lecturers was workload (PR = 5.12; 95% CI = 1.02-23.60) after being controlled by rest patterns, family history, work stress, and eating patterns, with the P-value model that was formed was 0.002, which means that the model formed from these 5 variables was significant and able to predict the incidence of NCDs in lecturers (Table 3).

DISCUSSION

This research found that the incidence of early death among lecturers at the Jambi Ministry of Health Polytechnic within 10 year was 3.7% or 1.9% per 5 years. This proportion is lower compared to the results of previous research that found that lecturer deaths at Universitas Jambi conducted within 5 year were 2.5% (9). This difference in the proportion of incidents of early death is also possible due to the differences in the Ministries that oversee the two institutions. Health Polytechnics are under the Ministry of Health while Universitas Jambi is under the Ministry of Education and Culture which have different policies and budgets. Even though they are both managed by the Government, they differ in the form of institutions and also the number of study programs and their governance, as well as the number of lecturers and the number of students served. The Health Polytechnic only consists of 7 departments and the number of lecturers does not reach 150 people with a total of less than thousands of students, whereas Universitas Jambi has dozens of departments from various faculties with more than 80 study programs and a number of lecturers is more than 1000 people and the number of students reaches thousands. which results in higher workloads. Lecturers can teach at various levels of study programs including vocational up to doctoral degree, while Jambi Ministry of Health Polytechnic is limited to Diploma III and Diploma IV students.

The results of this study found that the cause of early death among lecturers at the Health Polytechnic was 100% due to non-communicable diseases, namely heart disease and hypertension, cervical cancer, hypertension and DM, and liver disorders. The findings of this research are in line with Kalsum et al (2021) found that early deaths among lecturers at Universitas Jambi were caused by non-communicable diseases, reached 96%, including the majority of which were due to DM, heart attacks, cancer, hypertension, and auto-immunity. The research findings at the Health Polytechnic are higher when compared with WHO data that states that the incidence of death due to non-communicable diseases was 63% (but in the general population). The results of this study regarding the causes of early death is in line with research by Margaresa (2020) which states that changes in disease patterns currently is caused by changes in human behavior. The biggest causes of morbidity and death are non-communicable diseases (NCDs) such as stroke, heart disease, and diabetes (DM). NCDs do not only attack old age but has shifted to young age, and occurs in all circles (9,10).

Research findings regarding the incidence of non-communicable diseases among lecturers at the Jambi Ministry of Health Polytechnic were 17.3%. This figure is slightly higher than that reported by Tisna who found that the proportion of hypertension incidents among UNDIKSA (Ganesha Singaraja Education University) lecturers aged 40-59 years was 12.4% (11). The findings of this study are also much lower than those found by Suryanti et al (2022) who studied lecturers at UIN Sulthan Thaha Saifuddin Jambi and found that the proportion of lecturers who experienced hypertension was 63.8% (12). Previous research findings at Universitas Jambi were that 24.1% of lecturers suffered from non-communicable diseases (9). The differences in numbers found are due to different ways of measuring variables. However, there is a trend that lecturers experiencing NCDs is increasing, in line with conditions that also occur in the general population.

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This study found that the factors related to the incidence of NCDS in lecturers at the Health Polytechnic of the Ministry of Health in Jambi were workload, work stress, family history, eating patterns, and rest patterns, where the dominant factor in the incidence of NCDs in lecturers was workload after controlling for rest patterns, family history, work stress and eating patterns. Lecturers who work with a heavy workload (> 16 credits/semester) are five times more likely to suffer from NCDs than lecturers with a moderate or light workload after controlling for work stress, family history, eating patterns, and rest patterns. Workload is several activities that require expertise and must be carried out within a certain period in physical or psychological form. Many of the Jambi Ministry of Health Polytechnic lecturers complain about the workload as lecturers. Some lecturers carry out credits that are more than mandatory lecturer credits, this is due to the increasing number of students at the Jambi Ministry of Health's Health Polytechnic so the ratio of the number of lecturers and students becomes unbalanced. Apart from teaching in their home-based study program, for example in the D3 study program, lecturers also teach in the D4 study program, and vice versa. The busyness and large number of teaching credits for lecturers can result in work stress and create high pressure on lecturers. A heavy workload causes feelings of pressure, which causes blood pressure to rise. Apart from that, lecturers who are busy carrying out the duties of the Tri Darma of Higher Education also do not have time for regular exercise (physical activity). These results in fat in the body increasing and accumulating that can inhibit blood flow (although in this study physical activity has not been proven to be significantly related to the incidence of NCDs, there is a tendency to increase the risk of developing NCDs up to 3 times greater among lecturers). Vessels that are squeezed by fat deposits cause high blood pressure. This is one of the causes of hypertension, in addition to work stress, poor diet, and lack of rest patterns.

The results of these studies are in line with research conducted by Ismayatun (2020) which states that there is a relationship between workload and the incidence of hypertension. The physical workload is also one of the factors that cause an increase in blood pressure because the heavier the workload, the more the body needs energy and oxygen supply, therefore the heart pumps harder to meet these demands, and blood pressure increases (13).

Another finding in this study is that lecturers who have a family history of suffering from NCDs are at greater risk than those who do not have a family history after controlling for workload, work stress, eating patterns, and rest patterns. Based on the results of research that has been carried out, it was found that family history is related to the incidence of NCDs. Lecturers who have a family history of NCDs (for example DM or Hypertension) are more at risk of experiencing these non-communicable diseases than lecturers who do not have a family history. Family history is one factor that can't be avoided. If one of the parents suffers from Diabetes Mellitus, the child's risk of suffering from Diabetes Mellitus is greater than that of children who do not have a family history of Diabetes Mellitus. This risk will increase if both parents suffer from diabetes mellitus. If a lecturer's parents have healthy eating habits, they tend to pass them on to the next generation. Unhealthy eating habits accompanied by infrequent physical activity increase the risk of experiencing high blood sugar levels, so there is a risk of developing Diabetes Mellitus when in productive age or old age. Diabetes can occur due to a complex interaction between genetic predisposition and a person's unhealthy lifestyle behavior, thus strengthening the emergence of Diabetes Mellitus (14).

The results of this research are in line with those conducted by Nuraisyah et al. who found that there was a relationship between family history and the incidence of Diabetes Mellitus. The group that has a family history is 3.7 times more likely to

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develop Diabetes Mellitus than the group that has no family history. 10 Another research is research conducted by Nasution et al. which states that there is a relationship between family history and the incidence of diabetes, where the group with a family history is 5.6 times more likely to develop diabetes compared to the group without a family history (15).

Lecturers with inadequate rest patterns are almost 4 times more likely to suffer from NCDs than lecturers with sufficient rest patterns (>= 7 hours/day), also controlled by workload, work stress, family history, and eating patterns. Normal sleep patterns in young adults (18-40 years old) and middle adults (40-60 years old) are around 7-8 hours/day. Lack of duration of sleep at night, lack of napping habits, short-term sleep, and low-quality sleep can damage a person's metabolism, thereby triggering a decrease in glucose tolerance and also an increase in blood pressure. This research is in line with that conducted by Haskas (2018) who stated that there is a relationship between sleep rest and the incidence of diabetes mellitus (16).

Most lecturers sleep after 23.00 WIB, reaching 51%, there are even lecturers who are used to sleeping at night starting at 00.00 WIB. However, most lecturers admitted that their sleep quality was good, reaching 81.3%. In the same proportion, most lecturers are also not used to sleeping during the day. The results of the exploration of lecturers' rest patterns showed that there were still 31% of lecturers who worked on Saturdays and 25.3% also admitted that they still worked on Sundays. This pattern of rest, which tends to be less, will also trigger lecturers to experience stress, both psychological and physical.

The findings of this research are that lecturers who experience work stress are almost twice as likely to suffer from NCDs as lecturers who do not experience work stress after controlling for workload, family history, eating patterns, and rest patterns. The results of this research are in line with research conducted by Ridho et al. (2021) that proves that the higher the level of stress

experienced by a person, the higher the hypertension experienced, conversely, the lower the level of stress experienced, the milder the hypertension experienced. The relationship between stress and the incidence of hypertension from several studies shows that the incidence of stress is still high so it is a risk factor for hypertension from mild, moderate to severe levels (17). Similar research conducted by Ramdani et al. (2020) shows that there is a relationship between stress levels and the incidence of hypertension (18).

The results of this research found that lecturers who experienced physical stress reached 42.7%, while experiencing psychological stress was slightly higher, namely 46.7%. Lecturers who experienced emotional stress reached 53.3%. An assessment of the level of work stress found that 46.7% experienced moderate work stress and, 8% of lecturers experienced severe stress, meaning that more than half of the lecturers experienced moderate to severe work stress (data not shown). Stress needs to be managed so as not to cause an increase in the incidence of non-communicable diseases, one of which is hypertension. Stress will increase peripheral vascular resistance and cardiac output, thereby stimulating sympathetic nerve activity. This stress is closely related to work, socio-economic class, and personal characteristics (11). The Ministry of Health in its non-communicable disease control and prevention program has stated that one of them is managing stress in the acronym CERDIK behavior, namely regular health checks, getting rid of cigarette smoke, regular physical activity, balanced diet, getting enough rest and managing stress (19).

However, the results of this research have not been able to show a positive relationship pattern between eating patterns and the incidence of NCDS in lecturers. This study found that lecturers with poor eating patterns (in this case with indicators of insufficient consumption of vegetables and fruit) reduced the risk of developing NCDs, but after controlling for workload, work

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stress, family history, and rest patterns. The absence of a correlation between diet and the incidence of non-communicable diseases (Hypertension and DM) is similar to the results of research conducted by Wahyuni where there was no correlation between diet and the incidence of Diabetes Mellitus (20). Also in line with the results of research conducted by Abadi et al. which states that there is no relationship between diet and the incidence of hypertension (21) However, this is not in line with research conducted by Nuraini and Supriatna which found that there is an influence between diet and the incidence of diabetes mellitus. Likewise, research conducted by Elbarini et al. states that there is a correlation between diet and the incidence of Diabetes Mellitus, but this research was in the general population (22,23).

The absence of a significant contribution between diet and the incidence of non-communicable diseases (especially the incidence of hypertension and DM) in lecturers is possible because good and bad eating patterns in this study were only assessed from fruit and vegetable consumption patterns, while diet was the menu of food eaten. In his daily life as a whole, he doesn't only consume fiber such as vegetables and fruit. Many foods that are at risk for hypertension and diabetes besides fruit and vegetables, namely foods high in fat and salt, foods high in sugar, and foods made from processed flour. This is a limitation in this research. However, diet is a confounding variable in the prediction model for the incidence of NCDs whose contribution cannot be ignored.

All variables contained in the final model, namely workload, stress, family history, rest patterns, and eating patterns, contribute to the incidence of NCDs, which means that the incidence of NCDs is influenced by various factors (multicausal) with different contribution sizes from the variables or factors. these risks. Special attention must be paid to lecturers who have a family history and it is important to always implement CERDIK behavior so that lecturers avoid incidents of NCDs, especially

hypertension and DM, which are currently major contributors to death, especially in cases of premature death among lecturers.

Even though we have tried to control confounding using multivariate analysis, this research is certainly not free from limitations, namely that many families of lecturers who died refused to be interviewed so on the variable of premature death, researchers were unable to obtain the desired data to determine the relationship between eating patterns, rest patterns, and history. family, physical activity, work stress, and workload with premature death in lecturers because it is only limited to the availability of secondary data from BAUK institutions. Limitations in terms of cross-sectional study design include the possibility of temporal ambiguity bias and the possibility that there are still measurements of variables that have the potential for recall bias, such as dietary pattern variables which are carried out using of interviews regarding vegetable and fruit consumption patterns.

CONCLUSIONS

The proportion of non-communicable diseases (Hypertension and Diabetes Mellitus) among Health Polytechnic lecturers was 17.3%. The proportion of early deaths among lecturers in the last 10 years was 3.17% with an incidence rate of 1.75 person-years. Factors related to the incidence of NCDs in lecturers were heavy workload, family history, work stress, and poor rest patterns. The dominant factor in the incidence of NCDs in lecturers was a heavy workload after being controlled by family history, work stress, lack of rest patterns, and poor eating patterns.

It is recommended for lecturers to maintain their workload, manage the work stress, get enough rest at least 7 hours a day and maintain their diet also implement a balanced nutritional diet, especially for lecturers who have a family history of NCDs. Lecturers are strongly advised to implement "CERDIK" behavior (regular health checks, getting rid of cigarette smoke, being diligent in physical activity, having a balanced diet, get enough rest, and managing stress) as an

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effort to prevent the occurrence of NCDs and early deaths due to NCDs. Educational institutions needs to implement "GERMAS" and carry out "Posbindu PTM" periodically in the workplace so that routine health checks are obtained. The Government need a review the policy arrangements for implementing the "Tri-dharma" obligations of Higher Education that must be carried out by lecturers in Indonesia wisely.

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