

Comorbid Diabetes Mellitus and Hypertension Are Associated with Istithaah Status in Hajj Pilgrims

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ABSTRACT

Hajj pilgrim health istithaah is empowering the congregation's health through quantifiable physical and mental assessments so that the congregation can carry out their worship by Islamic religious guidance. Indonesian Hajj pilgrims are generally elderly and have a high risk of health problems. Common health problems like hypertension and diabetes mellitus. This study objective to analyze the impact of comorbid diabetes mellitus and hypertension on the health status of Hajj pilgrims. Cross-sectional observational analysis was employed in this study. The subjects used simple random sampling and the number of respondents was 289. Data analysis used statistical analysis tests using SPSS. Univariate and bivariate analyses are used in the data analysis. The results of the bivariate analysis between comorbid diabetes mellitus and istithaah status using Chi-Square test showed that $p=0.04$ ($p<0.05$) and Spearman Correlation test showed that $p=0.01$ ($p<0.05$). The results of the bivariate analysis between comorbid hypertension and istithaah status using Chi-Square test showed that $p=0.01$ ($p<0.05$) and Spearman Correlation test showed that $p=0.01$ ($p<0.05$). There is a significant relationship between comorbidities of diabetes mellitus and hypertension with istithaah status among prospective Hajj pilgrims embarking in Medan City, North Sumatra Province in 2024.



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KEYWORDS:

Diabetes Mellitus, Hajj Pilgrim, Hypertension, Istithaah Status

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INTRODUCTION

Every prospective hajj pilgrim must have the istithaah requirements. Istithaah is the ability or physical capability, cost, and security to travel to Mecca and perform the Hajj pilgrimage. Hajj pilgrim health istithaah is empowering the health of the congregation which includes measurable physical and mental examinations, so that the congregation can carry out their worship in accordance with Islamic religious guidance¹.

Health is defined as the full range of physical, mental, and social well-being that does not focus

solely on the absence of disease or infirmity². Based on the Decree of the Minister of Health of the Republic of Indonesia No. 1394/MENKES/SK/XI/2009 considers that holding the Hajj pilgrimage not only requires preparation from the aspect of religious demands but also physical readiness so that the Hajj pilgrimage can run well, orderly, and smoothly. The implementation of health istithaah for Hajj pilgrims is regulated by Minister of Health Regulation (Permenkes) Number 15 of 2018 explaining the stages or efforts through health

checks and guidance for Hajj pilgrims to achieve Health Istithaah³.

Every hajj pilgrim is at risk for health problems. The Indonesian Ministry of Health's Hajj Health Center report on the implementation of Hajj health in Saudi Arabia in 2019 stated that 63.8% of all Indonesian Hajj pilgrims who went to the Holy Land were pilgrims who had high health risks, both in terms of age and comorbidities. Common health problems like hypertension and diabetes mellitus cardiovascular disease, chronic obstructive pulmonary disease (COPD), respiratory tract infections, stroke, urinary tract infections, psychiatric disorders and cancer⁴. There is a paradigm in determining istithaah for Hajj pilgrims with a high risk of health problems because the integrated non-communicable disease development post program (Posbindu PTM) has not been implemented effectively to deal with health problems among Indonesian Hajj pilgrims. Hajj pilgrims with comorbidities such as DM and hypertension who do not receive appropriate treatment and management of risk factors can experience complications and health problems during the Hajj pilgrimage in Saudi Arabia⁴.

Diabetes mellitus has become a major public health problem in Indonesia. Diabetes mellitus (DM) is a condition of absolute insulin deficiency and impaired insulin function. Type 2 diabetes mellitus (T2DM) is a metabolic disease characterized by

hyperglycemia, resulting from abnormalities in insulin secretion, insulin action or both⁵.

Type 2 diabetes mellitus covers more than 90% of all diabetic populations. International Diabetes Federation (IDF) in 2011 announced that 336 million people worldwide suffer from T2DM and that this disease is associated with 4.6 million deaths each year, or one death every seven seconds. World Health Organization (WHO) predicts an increase in the number of DM sufferers in Indonesia from 8.4 million in 2000 to around 21.3 million in 2030⁶. According to the Indonesian Ministry of Health's RISKESDAS findings from 2018, the country's prevalence of diabetes mellitus rose from 6.9% in 2013 to 8.5% in 2018⁷.

Hypertension is one of the biggest health problems in the elderly. Hypertension or high blood pressure is a condition where systolic blood pressure ≥ 140 mmHg and diastolic blood pressure ≥ 90 mmHg are checked in at least 2 measurements at 2 different visit⁸. One of the most concerning health issues nowadays is hypertension, particularly among the elderly. The World Health Organization (WHO) estimates that 972 million people worldwide, or 26.4% of the total population, suffered from hypertension in 2008. By 2025, this percentage is probably going to rise to 29.2%. The entire population afflicted with hypertension. There are 972 million people in the world, of which about 333

million live in affluent nations, while the remaining 639 million live in developing nations like Indonesia⁹.

Risk factors for hypertension consist of modifiable and non-modifiable risk factors. Some modifiable risk factors are obesity, smoking, lack of fruit and vegetable consumption, excessive salt and fat intake, excessive alcohol consumption, lack of physical activity. Non-modifiable risk factors are age, gender, and family history of hypertension¹⁰. Currently, hypertension is the third risk factor for premature death. One of the populations at risk of experiencing disorders due to hypertension is the elderly. Increasing age causes a decrease in function of the body's organs, characterized by decreased arterial elasticity and the occurrence of stiffness in blood vessels so that it will very vulnerable to an increase in blood pressure blood pressure in the elderly ¹¹.

METHODS

This type of research is an observational analysis study with a cross-sectional design where data collection is only taken once using primary and secondary data. This research was conducted at the Faculty of Medicine, University of Muhammadiyah North Sumatra from June-August 2024. This study has passed the ethical review by the Health Research Ethics Committee (KEPK) of the Faculty of Medicine, Universitas Muhammadiyah Sumatera Utara, No: 1190/KEPK/FKUMSU/2024. The population in this study were all prospective hajj pilgrims embarking in

Medan City, North Sumatra Province in 2024. The sample in this study were prospective hajj pilgrims embarking in Medan City, North Sumatra Province in 2024 who met the inclusion and exclusion criteria. The inclusion criteria in this study were all prospective hajj pilgrims embarking in Medan City in 2024. The exclusion criteria in this study were prospective hajj pilgrims embarking in Medan City in 2024 who made errors filling in their data. Sampling was carried out using the simple random sampling method using a questionnaire that would be given and filled in by the sample. The data used in this study were primary data and secondary data. Primary data were collected directly using a questionnaire given to respondents before departure and secondary data were collected from the documentation of the health siskohat for the embarkation/disembarkation of the Medan City hajj in 2024. The data obtained were analyzed statistically with univariate and bivariate analysis. The research hypothesis was tested using the Chi-square Test with a p-value <0.05. To analyze the relationship between comorbidities of diabetes mellitus and hypertension and the health status of hajj pilgrims. The results will be re-analyzed using the Spearman correlation method to analyze the data analysis in this study using the statistic software.

RESULT AND DISCUSSION

Respondent characteristics are presented in table 1. Based on the table 1, it was found that the characteristics of respondents based on female gender more than male. Respondents with higher education are more than those with lower education.

Table 1. Distribution of Respondent Characteristics

Demographic Characteristics	Frequency (n)	Percentage (%)
Gender		
Male	123	42.6
Female	166	57.4
Age		
41 – 50 Years	101	34.9
50 – 60 Years	102	35.3
>60 Years	86	29.8
Last education		
Elementary School	13	4.5
Junior High School	9	3.1
Senior High School	92	31.8
College	175	60.6
Occupation		
ASN	63	21.8
BUMN	12	4.2
Private	77	26.6
Does not work	137	47.4
Marriage status		
Married	248	85.8
Single	7	2.4
Divorced Life	6	2.1
Divorced Dead	28	9.7
Ethnic group		
Batak	79	27.3
Java	78	27.0
Karo	12	4.2
Malay	30	10.4
Nias	4	1.4
Padang	34	11.8
India	3	1.0
Aceh	19	6.6
Mandailing	25	8.7
Pakpak	1	0.3
Simalungun	1	0.3
South Tapanuli	1	0.3
Gayo	2	0.7
Total	289	100

Table 2. Chi Square Test Result of The Relationship Between Diabetes Mellitus Comorbidity and Istithaah Status

Treated diabetes	Istithaah Status		Total	p
	Istithaah	Istithaah with a companion		
Yes	1	35	36	0.004
No	44	122	166	
Never	26	61	87	
Total	71	218	289	

Table 3. Chi Square Test Results of The Relationship Between Hypertension Comorbidity and Istithaah Status

Hypertension medication	Istithaah Status		Total	p
	Istithaah	Istithaah with a companion		
Yes	6	72	78	0.001
No	41	101	142	
Never	24	45	69	
Total	71	218	289	

Based on the research results in the table 2, a significant relationship was found between diabetes mellitus comorbidity and istithaah status among prospective Hajj pilgrims embarking in Medan City, North Sumatra Province in 2024. This was proven by testing using the Chi Square test which obtained a significance figure (p -value) of 0.004. It was found that 1 person (2.8%) was currently being treated for diabetes and had istithaah status, 35 respondents who were being treated for diabetes and had istithaah status with a companion were 35 people (97.2%), respondents who were not currently undergoing treatment. Those undergoing treatment for diabetes and having istithaah status were 44 people (26.5%), respondents who were not currently undergoing treatment for diabetes and had istithaah status with a companion were 122 people (73.5%), respondents who had never received

treatment for diabetes and There were 26 people (29.9%) with istithaah status and 61 respondents (70.1%) who had never received treatment for diabetes and had istithaah status with a companion.

Prospective Hajj pilgrims who are not currently being treated for diabetes are more likely to be categorized into Istithaah status and accompanying Istithaah status compared to prospective Hajj pilgrims who are being treated for diabetes. Prospective Hajj pilgrims who have never undergone treatment for diabetes are also more likely to be categorized into Istithaah status and accompanying Istithaah status compared to prospective Hajj pilgrims who are currently undergoing treatment for diabetes. Based on research conducted by Alsafadi (2011), prospective Hajj pilgrims who suffer from diabetes mellitus are at high risk of experiencing complications such as hyperglycemia, hypoglycemia, diabetic ulcers and impaired kidney function ¹². According to research conducted by Huda (2022), it also shows that there is a significant relationship between diabetes mellitus and the incidence of death in Hajj pilgrims embarking on Sultan Hasanuddin Makassar¹³. The increased risk of developing diabetes mellitus, especially at the age of more than 40 years, is because at that age glucose intolerance begins to increase. The aging process causes a reduction in the ability of pancreatic β cells to produce insulin. In addition, in older individuals there is a 35% decrease in mitochondrial activity in muscle cells. This is associated with an increase in fat levels in the muscles by 30% and triggers insulin resistance ¹⁴.

Based on table 3, it was found that there was a significant relationship between hypertension comorbidity and istithaah status among prospective Hajj pilgrims embarking in Medan City, North Sumatra Province in 2024. This was proven by testing using the Chi Square test which obtained a significance number (p -value) of 0.001. There were 6 respondents who were taking hypertension medication and had istithaah status (7.7%), 72 respondents who were taking hypertension medication and had istithaah status with a companion (92.3%), respondents who were not taking hypertension medication and had the status Istithaah was 41 people (28.9%), respondents who were not taking hypertension medication and had istithaah status with a companion were 101 people (71.1%), respondents who had never taken hypertension medication and had istithaah status were 24 people (34.8%), respondents who had never taken hypertension medication and had istithaah status with a companion were 45 people (65.2%). Prospective Hajj pilgrims who are not taking hypertension medication are more likely to be categorized into istithaah status and accompanying istithaah status compared to prospective Hajj pilgrims who are taking hypertension medication. Prospective Hajj pilgrims who have never taken hypertension medication are also more likely to be categorized into istithaah status and accompanying istithaah status compared to prospective Hajj pilgrims who are taking hypertension medication.

Hypertension can generally increase the risk of coronary heart disease, congestive heart failure, and kidney disease. Untreated hypertension will affect all

organ systems and ultimately shorten life expectancy by 10-20 years. Mortality in hypertensive patients is faster if the disease is not controlled and has caused complications in several vital organs ¹⁵. According to research conducted by Dramawan (2021), the compliance of hypertensive patients in carrying out the therapy that has been given properly will enable hypertensive sufferers to achieve blood pressure targets in controlled conditions over a long period of time. Compliance with taking antihypertensive drugs is the key to successful hypertension therapy ¹⁶.

Mostly, hypertension begins to be diagnosed in adulthood to old age which is caused by risk factors such as age, genetics, gender, obesity, smoking, stress, lack of physical activity, and excessive salt intake ¹⁷. The previous study shows that at the age of >40 years physiologically the elasticity of blood vessels decreases so that the ability to vasodilate will decrease and this will result in increased blood pressure ¹⁸.

Table 7. Spearman Correlation Test Results of The Relationship Between Diabetes Mellitus Comorbidity and Istithaah Status

Variable		Currently being treated for diabetes by a doctor	Istithaah Status
Currently being treated for diabetes by a doctor	Correlation Coefficient	1.000	-.150
	Sig. (2-tailed)	.	.011
	N	289	289
Istithaah Status	Correlation Coefficient	-.150	1000
	Sig. (2-tailed)	.011	.
	N	289	289

Based on the research results in the table above, a significant relationship was found between comorbidity of diabetes mellitus and istithaah status in prospective Hajj pilgrims embarking in Medan City, North Sumatra Province in 2024. This is proven by testing using the Spearman correlation test which obtained a significance number (p -value) of 0.011 ($p < 0.05$), with a correlation coefficient value (r) = -0.150 meaning that the correlation is weak and the direction of the correlation is negative, which means that the relationship between the two variables is not in the same direction, This means that if the comorbid diabetes mellitus increases, it will have an impact on reducing the istithaah status of the Hajj pilgrims.

Table 8. Spearman Correlation Test Results of The Relationship Between Hypertension Comorbidity and Istithaah Status

Variable		Currently taking hypertension medication	Istithaah Status
Currently taking hypertension medication	Correlation Coefficient	1.000	-.229
	Sig. (2-tailed)	.	<.001
	N	289	289
Istithaah Status	Correlation Coefficient	-.229	1000
	Sig. (2-tailed)	<.001	.
	N	289	289

Based on the research results in the table, a significant relationship was found between hypertension comorbidity and istithaah status in prospective Hajj pilgrims embarking in Medan City, North Sumatra Province in 2024. This is proven by testing using the Spearman correlation test which

obtained a significance number (P-Value) of 0.001 ($P < 0.05$), with a correlation coefficient value (r) = -0.229 meaning that the correlation is weak and the direction of the correlation is negative, which means that the relationship between the two variables is not in the same direction, which means that the relationship between the two variables is not in the same direction, This means that if the comorbid hipertensi increases, it will have an impact on reducing the istithaah status of the Hajj pilgrims embarking in Medan City, North Sumatra Province in 2024. Based on this study, comorbidities of diabetes mellitus and hypertension are associated with istithaah status in pilgrims with a significance value associated with weak relationship strength and negative relationship direction (-). This means that comorbidities of diabetes mellitus and hypertension have a relationship but the correlation between variables has a weak strength because it is influenced by the background of respondents who are suspected of having other comorbidities such as renal failure (35.1%), dementia (11.7%), tuberculosis (7.4%), type 2 diabetes mellitus (6.4%), and essential hypertension (6.4%)¹⁹. This study has a negative relationship direction (-) because an increase in comorbidities from diabetes mellitus and hypertension causes a decrease in istithaah status in hajj pilgrims.

The limitation of this research is that blood pressure measurements were not carried out in this

study to confirm the diagnosis of hypertension in research subjects but only through a questionnaire in the form of questions regarding whether the research subjects took hypertension medication, there was limited research time and the respondents poor ability to understand the questions in the questionnaire so the results may be less accurate.

CONCLUSION

The conclusion of the research conducted is that there is a relationship between comorbid hypertension and diabetes mellitus with istithaah status in prospective Hajj pilgrims for the Medan City embarkation of North Sumatra Province in 2024. Hajj health checks and coaching affect the health status of Hajj pilgrims, including controlling risk factors such as hypertension and diabetes mellitus to reduce cases of morbidity or mortality in Hajj pilgrims. Further research is recommended to obtain more accurate data through diagnoses from medical personnel, namely diagnoses from doctors. Future research is also expected to carry out screening examinations for other comorbid diseases. Weaknesses in this study are that the respondents were not included in the category of controlled or uncontrolled diabetes mellitus and the respondents did not have their blood pressure measured but only filled out a questionnaire containing data regarding the consumption of antihypertensive drugs. This research is a pre survey's study to access the comorbidities of diabetes mellitus and hypertension

on istithaah status and as a reference for further research.

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