Faktor yang Berhubungan dengan Praktik Pencegahan Diabetes Mellitus Tipe 2

Factors Associated with Preventive Practices of Type 2 Diabetes Mellitus

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ABSTRACT

***Background**: Diabetes mellitus is a non-communicable disease that can be prevented by controlling the risk factors. Diabetes mellitus prevention practice is important so that prevention of type 2 diabetes mellitus can be carried out effectively. There are several factors that cause a person to practice prevention against diabetes mellitus. **Objective**: This study aims to analyze factors related to the practice of type 2 diabetes mellitus prevention among Diponegoro University students in Semarang. **Methods**: This is a quantitative study with an observational analytic approach and a cross-sectional study design. The time of research was May-August 2020. The instrument in this study was a google form questionnaire. The population in this study were active undergraduate students of Diponegoro University in 2020, amounting to 36,425 students. The sample size in this study was 407 respondents. The variables of the study were family history of type 2 diabetes mellitus, knowledge level, attitude, family support, and preventive practices of type 2 diabetes mellitus. This study used univariate analysis and bivariate analysis. The relationship test was performed using the chi-square test on a computer application. **Results**: This study showed there was a significant relationship between family history type 2 diabetes mellitus (0,017), knowledge level (0,00), attitude (0,00), and family support (0,00) for the preventive practices of type 2 diabetes mellitus in students. **Conclusion**: Family history of type 2 diabetes mellitus, knowledge level, attitude, and family support are factors related to the preventive practices of type 2 diabetes mellitus among students of Diponegoro University in Semarang. There is a need for education and provision of information related to knowledge on diabetes mellitus prevention for students at Diponegoro University, Semarang.*

***Keyword**: College Students, Practice, Prevention, Type 2 diabetes mellitus*

ABSTRAK

***Latar Belakang**: Diabetes mellitus merupakan penyakit tidak menular yang dapat dicegah dengan mengendalikan faktor risikonya. Praktik pencegahan diabetes mellitus penting dilakukan agar pencegahan penyakit diabetes mellitus dapat dilakukan secara efektif. Seseorang dalam melakukan praktik pencegahan terhadap penyakit diabetes mellitus dipengaruhi oleh beberapa faktor. **Tujuan**: Tujuan dari penelitian ini adalah menganalisis faktor yang berhubungan dengan praktik pencegahan diabetes mellitus tipe 2 pada mahasiswa Universitas Diponegoro Semarang. **Metode**: Penelitian kuantitatif dengan pendekatan analitik observasional dan menggunaakan desain studi cross-sectional. Waktu pelaksanaan penelitian yaitu Bulan Mei-Agustus 2020. Instrumen dalam penelitian ini yaitu berupa angket google form. Populasi pada penelitian ini adalah mahasiswa aktif S1 Universitas Diponegoro tahun 2020 yang berjumlah 36.425 mahasiswa. Besar sampel dalam penelitian ini sebanyak 407 responden. Variabel dalam penelitian ini adalah riwayat keluarga menderita diabetes mellitus tipe 2, tingkat pengetahuan, sikap, dan dukungan keluarga dan praktik pencegahan diabetes mellitus tipe 2. Penelitian ini menggunakan analisis univariat dan analisis bivariat. Uji hubungan dilakukan dengan menggunakan uji chi-square pada aplikasi komputer. **Hasil**: Hasil penelitian menunjukkan terdapat hubungan yang signifikan antara riwayat keluarga menderita diabetes mellitus*

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tipe 2 (0,017), tingkat pengetahuan (0,001), sikap (0,001) dan dukungan keluarga (0,001) terhadap praktik pencegahan diabetes mellitus tipe 2 pada mahasiswa. ***Kesimpulan:*** *Riwayat keluarga menderita diabetes mellitus tipe 2, tingkat pengetahuan, sikap, dan dukungan keluarga merupakan faktor-faktor yang berhubungan dengan praktik pencegahan diabetes mellitus tipe 2 pada mahasiswa Universitas Diponegoro Semarang. Perlu adanya edukasi dan pemberian informasi terkait pengetahuan pencegahan diabetes mellitus pada mahasiswa di Universitas Diponegoro Semarang.*

Kata Kunci*: Mahasiswa, Praktik, Pencegahan, Diabetes Mellitus tipe 2*

INTRODUCTION

Diabetes mellitus is a disease characterized by hyperglycemic due to obstructed insulin secretion and/or insulin action. Diabetes mellitus may cause long-term damage, dysfunction, and different organ failures, especially eyes, kidneys, nerves, heart, and blood vessels (World Health Organization, 2019). Diabetes mellitus is classified into two main groups, namely, type 1 diabetes mellitus (insulin-dependent diabetes mellitus) and type 2 diabetes mellitus (non-insulin-dependent diabetes mellitus) (George, Augustine and Sebastian, 2014; World Health Organization, 2019).

Type 2 diabetes mellitus if not properly treated will cause a severity that increases risks of complication (Wahyuningrum, Wahyono and Prabandari, 2017). Long-term complications may appear in form of retinopathy, nephropathy, peripheral neuropathy, neuropathic joint disease, and autonomic neuropathy, cardiovascular disease (CVD), and sexual dysfunction (World Health Organization, 2019).

Diabetes is found in every population and region all over the world, either in low-income, middle-income, and high-income countries. WHO data mentioned that there has been an increase in its prevalence in adults from 4.7% in 1980 to 8.5% in 2014, with the biggest increase in middle-income countries compared to the high-income ones (World Health Organization, 2016).

In Indonesia, according to Basic Health Research (Riskesdas) data, diabetes prevalence in 2018 was 2.0%. International Diabetes Federation in 2019 stated that in Indonesia the national diabetes prevalence reached 6.2% in the age group of 20-79 and ranked seventh as the highest diabetics in the world after China, India, United States, Brazil, Russia, and Mexico. In Central Java, diabetes mellitus cases ranked second in the world with cases amount of 21.85% for entire non-communicable disease cases (International Diabetes Federation, 2019). In Semarang city, according to Dinas Kesehatan Kota Semarang (District Level Health Office of Semarang City) data, type 2 diabetes mellitus ranked the second non-communicable disease of Semarang city after hipertension (Dinas Kesehatan Kota Semarang, 2018).

Type 2 diabetes mellitus is one of the non-communicable diseases that can be prevented by controlling its risk factors (Isnaini and Ratnasari, 2018). Lifestyle changes such as unbalanced eating habits that may cause obesity and a lack of physical activity are factors that were estimated to increase the risk factors of type 2 diabetes mellitus (Isnaini and Ratnasari, 2018). Routine physical exercises may increase the quality of blood vessels and improve all metabolic aspects including insulin sensitivity and glucose tolerance. Type 2 diabetes mellitus has other risk factors, such as age, family history of diabetes mellitus, body mass index (BMI), blood pressure, low education level, stress, and cholesterol level (Evi and Yanita, 2016; Rahalus, Asrifuddin and Kaunang, 2017).

College students are individuals in the age group of young adults, usually aged 18-25, during this adulthood period need to be responsible for their development, including for their adult lives (Hulukati and Djibran, 2018). The lives of independent college students, for their daily meals, will no longer be supervised directly by parents. Massive

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college schedule and student participation in various non-academic activities often impact their decision-making for food consumption to be all about instant and cheap. Morning exercise routines frequency decreases, hence imbalance between energy intake and energy expenditure. Bad living pattern tendencies may cause risks of non-communicable diseases like type 2 diabetes mellitus.

Diponegoro University is one of the public universities in Central Java. Its students must be able to be agents of change that actively helping the government in the prevention effort of non-communicable diseases in Indonesia. Prevention practice for diabetes mellitus is one of which, today there has been no research about factors associated with the practice on college students and seeing opportunities of college students who can be agents of change for diabetes prevention. This research aims to analyze the factors associated with the preventive practices of type 2 diabetes mellitus on students of Diponegoro University Semarang. It is hoped that knowing the factors will increase roles and participation of the students in the disease prevention efforts in Indonesia.

METHOD

This research has been ethically approved by the ethics committee of the Public Health Faculty of Universitas Airlangga with number of 150/EA/KEPK-FKM/2020. The time of research was May to August 2020. The type of research conducted was quantitative research, with analytical observational and using cross-sectional study design. The population of this research was active undergraduate students of Diponegoro University year 2019/2020 amounted to 26,425 people and the sample was 407 of them that were not having diabetes mellitus and were willing to be respondents. The sampling technique used to determine the sample was nonprobability sampling called accidental sampling.

Variables of this research consisted of uncontrolled variables and controlled variables. The uncontrolled variables were family history of type 2 diabetes mellitus, knowledge level, attitude, and family support. The controlled variables were preventive practices of type 2 diabetes mellitus which included smoking behavior, smoking habit, smoker's environment, alcoholic habit, blood glucose level testing, exercise type, exercise frequency, exercise duration, eating duration, type of food ingredient, food consumption, and drink with high-glycemic index.

Data collection was conducted by spreading Google form questionnaires on social media. The questionnaires consisted of questions about the research variables. Secondary data were obtained from existing data from previous research pieces as supporting data. Scoring was conducted by giving a score of 1 for correct answers and 0 for incorrect answers. Relationship test was conducted using the chi-square test on a computer application. This test was used because the research variables were nominal.

RESULTS AND DISCUSSION

One that had diabetes mellitus was suspected to have the genetics of diabetes mellitus. Either from father, mother, or sibling. It was suspected that the diabetes carrier was a recessive agent. Only someone characterized as homozygote with the recessive agent would get diabetes mellitus. If one of their parents had diabetes mellitus thus the risk to get diabetes mellitus would be 15%. If both parents had diabetes mellitus thus the risk to get diabetes mellitus would be 75%. The risk to get diabetes mellitus from mother was larger by 10-30% than father with diabetes mellitus. This was caused by a decrease in genetics when inside the womb was larger from the mother. If a sibling had diabetes mellitus thus the risk to get diabetes mellitus would be 10% and it would become 90% if the one had it was an identical twin sibling (Wolde *et al.*, 2017; Paramitha and Lestari, 2019). According to the research results, it was discovered that there were respondents with risk factors of diabetes mellitus from family by 21.4%.

Knowledge is the basis of someone to determine the attitude to hence be implemented in a form of practice (Alemayehu, Dagne and Dagnew, 2020). The research conducted in Jordan in 2018 showed that 53.3% of the respondents had a good knowledge of diabetes mellitus (Alsous *et al.*, 2019). This research

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showed that the respondents with the knowledge related to type 2 diabetes mellitus were 51.6% and it was not far from the results of the research in Jordan.

Attitude is a reaction or response that is still closed off by someone towards a stimulus or object. Attitude is a mental condition and thinking condition that is prepared to give response towards an object through experience also affect directly or indirectly on practice or action (Notoatmojo, 2012). A study that has been conducted in Sri Lanka stated that 90% of the respondents had a bad attitude towards diabetes mellitus (Herath *et al.*, 2017). This research obtained results that 53.3% of the respondents had a good attitude towards diabetes mellitus. The good attitude was hoped to be in line with the implementation of preventive practices for diabetes mellitus (Lestari, 2019).

Family support related to preventive practices of type 2 diabetes mellitus showed that the majority of the respondents had supportive families by 58.7%. Family is an influencing factor towards health beliefs and health values of someone (Hendayani and Afnuhazi, 2018). Family support is an important aspect in a family because the effects that originate from family support towards health and well-being function altogether and the engagement of family in giving support will raise a good awareness for the family members to prevent and manage a disease (Ravi, Kumar and Gopichandran, 2018).

Tabel 1. Respondent Characteristics

Respondent Characteristics	n	%
Family history of Type 2 Diabetes Mellitus		
None	320	78.6
Father and Mother	4	1.0
Mother	26	6.4
Father	46	11.3
Sibling	11	2.7
Education Level		
Good	210	51.6
Bad	197	48.4
Attitude		
Good	217	53.3
Bad	190	46.7
Family Support		
Supportive	239	58.7
Unsupportive	168	41.3
Practice		
Good	211	51.8
Bad	196	48.2
Total	407	100%

Table 1 showed that for the practices of the respondents in conducting prevention for type 2 diabetes mellitus, more than half had good practices, which was by 51.8%. Another research conducted in Jordan with respondent amount of 1,702 in 2018 showed that 62.3% of the respondents have implemented the preventive practices of diabetes mellitus and 37.7% have not implemented the preventive practices of diabetes mellitus (Alsous *et al.*, 2019).

Table 2. Bivariate Analysis Results

Respondent Characteristics	DMT2 Preventive practices						P Value*
	Bad		Good		Total		
	n	%	n	%	N	%	
Family history of diabetes Mellitus							
Existent	32	36.8	55	63.2	87	100.0	0.017
Inexistent	164	51.2	156	48.8	320	100.0	
Knowledge Level							
Bad	115	58.4	82	41.6	197	100.0	0.001
Good	81	38.6	129	61.4	210	100.0	
Attitude							
Bad	126	66.3	64	33.7	190	100.0	0.001
Good	70	32.3	147	67.7	217	100.0	
Family Support							
Supportive	105	62.5	63	37.5	168	100.0	0.001
Unsupportive	91	38.1	148	61.9	239	100.0	

Chi-square *Significant p<0,05

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Relationship between Family history of diabetes Mellitus and Preventive practices of Type 2 diabetes mellitus

Someone with a family member that has diabetes mellitus has a bigger probability to get diabetes mellitus than someone without a family member that has diabetes mellitus. Genetic risk factors become the cause of inherited diabetes mellitus, and there is the same lifestyle pattern among family members (Tamornpark *et al.*, 2017). Someone with a family member that has diabetes mellitus often connects with diabetic patients thus they have a better awareness of the incident and prevention of diabetes mellitus (Wolde *et al.*, 2017).

Results of this research showed that there was a significant relationship between family history of diabetes mellitus and preventive practices of diabetes mellitus. Respondents who knew they had the history tended to implement the preventive practices. The practices were namely not smoking, maintaining diet, and doing physical activity. The wrong diet without balanced physical activity or exercise was the trigger for overweight cases that could cause diabetes mellitus (Sudargo, 2014).

Results of this research were in line with research conducted in Ethiopia in 2014 about knowledge and preventive practices of diabetes mellitus on family members of diabetics. The research mentioned that having a diabetic family member was significantly related to good practices on incidents and preventions of diabetes mellitus (Wolde *et al.*, 2017).

Relationship between Knowledge Level and Preventive Practices of Type 2 Diabetes Mellitus

Knowledge holds a significant role in determining a whole behavior, because knowledge will form a belief that will perceive the reality, and give a basis for decision-making. Knowledge determines behavior towards a certain object, hence affects someone in doing a behavior (Amankwah-Poku, 2019). Knowledge level on type 2 diabetes mellitus can be inferred as something that is known by someone about type 2 diabetes mellitus. The knowledge includes the definition, symptoms, risk factors, diets, exercises or physical trainings, preventions, and diagnosis of type 2 diabetes mellitus. The knowledge that is possessed by an individual can affect them in doing a behavior (Salem *et al.*, 2018). The individual with the knowledge would be able to know what is needed, also solve their life needs. The formation of a new behavior starts from knowledge (cognitive), which means that someone knows the material first then the material will form the behavior and practice. Knowledge and understanding on diabetes mellitus will form behaviors or practices that will be implemented to prevent diabetes (Silalahi, 2019).

Results of this research showed there was a relation between knowledge level and preventive practices of type 2 diabetes mellitus in students of Diponegoro University Semarang. This research was in line with research conducted by Kharono which showed that most of the respondents did not know that when there were 3 family generations with diabetes it was a risk factor of the occurrence of type 2 diabetes mellitus (Kharono *et al.*, 2017). The majority of the respondents also did not know the diagnosis of type 2 diabetes mellitus. This ignorance caused the respondents not to implement the preventive practices of type 2 diabetes mellitus.

Results of this research were in line with research in Ethiopia in 2017 which showed that there was a significant relationship between knowledge and practice level of respondents in implementing prevention of diabetes mellitus type 2 (Kassahun and Mekonen, 2017). Knowledge of diabetes mellitus, symptoms, risk factors, diets, and diagnosis of type 2 diabetes mellitus affect someone in implementing the preventive practices of diabetes mellitus. Society's knowledge on diabetes is a requirement for individuals and the society to do disease preventive actions (Rose and L.Merz, 2020).

Relationship between Attitude and Preventive Practices of Type 2 Diabetes Mellitus

Attitude is a mental condition and thinking condition that is prepared to give a response towards an object through experiences and give impact directly or indirectly on practices or actions. The formation of one's practices starts from knowledge on stimulus in form of materials or objects about diabetes prevention hence emerging new knowledge in the

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subject. The next phase of the stimulus will cause an inner response in form of attitude towards the object that has been known, then, in the end, will emerge a response in form of actions of whether doing or not doing the diabetes mellitus prevention (Notoatmodjo, 2012).

Results of analysis in this research mentioned that there was a significant relationship between respondents' attitudes and preventive practices of diabetes mellitus. One's good attitudes on the importance of physical activity and maintaining a healthy diet in relation to type 2 diabetes mellitus prevention tended to cause implementation of preventive practices of type 2 diabetes mellitus. Parallel with research in Ethiopia in 2017 which showed that there was a significant relationship between attitudes and practices that one with a good attitude towards diabetes had an increase of 2-folds in practice level of diabetes mellitus prevention. Research results showed that individuals with a positive attitude towards diabetes would be easy to do a risk reduction of diabetes mellitus (Kassahun and Mekonen, 2017).

Relationship between Family Support and Preventive Practices of Type 2 Diabetes Mellitus

Family support is a helper that can be provided to other families in form of goods, services, encouragements, motivations, empathies, information, or advice which make support receivers feel loved, respected, and comfortable by the familiarity due to their existences and give the benefit of emotions or behavioral effects on the receivers. A family is a place that is safe and peaceful for its members to pour all the feelings they have to implement preventive practices and healing of a disease. The presence of others in one's private life is so needed. This happens because one does not possibly fulfill one's physical nor psychological needs by oneself. Individuals need social supports, where one of which originates from family. Family support is functional for health care, namely, health care function, and health condition maintenance function for the family members so that they have high productivity (Bisnu, Kepel and Mulyadi, 2017).

Results of this research were in line with that theory, where family support was related to preventive practices of diabetes mellitus in college students. Parallel with research conducted in Labuhanbantu in 2019 which showed that there was a significant relationship between family support and hyperglycemia prevention in Regional General Hospital Kotapinang, Kotapinang Subdistrict, Labuhanbatu Selatan District. Family support would affect respondents' willingness in implementing hyperglycemia preventions (Harahap, 2019).

Family support can be in form of provision of foods with balanced nutrition. Other forms can be mutual reminders on the importance of eating with balanced nutrition, mutual reminders on dangers of smoking and drinking alcohols, mutual reminders on doing exercise and explaining the importance of exercising. Family also has a significant role in explaining the importance of doing blood glucose level test to prevent diabetes mellitus as early as possible. Good family support by giving attentions and motivations will make respondents implement type 2 diabetes mellitus prevention. Family support that is given, namely, in form of provision of foods with balanced nutrition, explanation on dangers of smoking and drinking alcohols, explanation on the importance of exercising and doing exercise routinely, also explanation on the importance of checking blood glucose level routinely.

CONCLUSION

The majority of respondents did not have family history of diabetes mellitus. The percentage of respondents with good knowledge level, attitude, and practices was higher than the bad ones. Respondents with supportive families on doing preventive practices of type 2 diabetes mellitus were more than those unsupported. There was a significant relationship between family history of type 2 diabetes mellitus, knowledge level, attitude, and family support on preventive practices of type 2 diabetes mellitus in students of Diponegoro University Semarang. Advice that can be given by the researcher is that education and information provision of knowledge on diabetes mellitus prevention is necessary for students of Diponegoro University Semarang.

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