



PREDICTORS OF PREDIABETIC INSIDENCE AMONG ELDERLY IN KERITANG DISTRICT INDRAGIRI HILIR RIAU

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ABSTRACT

Prediabetic is a state when glucose level is higher than normal, but does not meet the criteria for diabetes. Elderly people with prediabetic have a higher risk of type 2 diabetes. This observational analytical research was conducted to assess the correlation between sociodemographic and health care behavior of elderly toward incident of prediabetic. The participants were selected according to the inclusion criteria, and 76 participants were selected using cluster sampling and cross sectional approach was used. Multivariate logistic regression was used to estimate the correlation between gender, marital status, education, knowledge, attitude, and practice toward incidence of prediabetic. Data were analyzed using logistic regression test. The results showed that there were no significant differences of gender ($p=1.000$), marital status ($p=1.80$), education ($p=1.000$), and knowledge ($p=1.000$). Meanwhile, there were significant differences of attitude ($p=0.003$), practice ($p=0.029$), and behavior ($p=0.012$). The Logistic Regression test showed that attitude ($OR=5.562$) was the predictor of prediabetic incidence among Elderly. The effort to improve and to maintain health status of elderly is by changing the behavior. This can be achieved through an intense cooperation with health promotion team in Primary Health Care, especially nursing community, in a form of education and health promotion with various methods, such as direct intervention, community and elderly empowerment, and sector cross partnership. It is also recommended for Primary Health community to build health centers for elderly to give them access for health service especially for non communicable diseases prevention.

Keywords : elderly, incidence of prediabetic, predictors

ABSTRAK

Pradiabetes merupakan kondisi kadar glukosa darah di atas normal, tapi belum memenuhi standar diagnosis diabetes. Lanjut usia dengan pradiabetes memiliki peningkatan terhadap Diabetes mellitus tipe 2. Penelitian ini merupakan analitik observasional yang dilakukan untuk mengetahui hubungan antara sosiodemografi dan perilaku perawatan kesehatan lanjut usia terhadap kejadian pradiabetes. Responden yang digunakan telah memenuhi kriteria inklusi dan sampel sebanyak 76 responden yang dipilih secara cluster sampling serta menggunakan metode cross sectional. Data diuji menggunakan regresi logistik. Hasil penelitian ini menunjukkan bahwa tidak ada hubungan antara jenis kelamin ($p=1,000$), status perkawinan ($p=0,80$), pendidikan ($p=1,00$), dan pengetahuan ($p=1,000$). Sementara itu, terdapat hubungan antara sikap ($p=0,003$), praktik ($p=0,029$), dan perilaku ($p= 0,012$). Hasil uji Regresi Logistik menunjukkan bahwa sikap ($OR=5.562$) adalah variabel yang paling dominan mempengaruhi insiden pradiabetes. Usaha untuk meningkatkan dan memelihara status kesehatan pada lanjut usia adalah dengan perubahan perilaku. Usaha tersebut melalui kerjasama yang baik dengan tim promosi kesehatan yang ada di Puskesmas, khususnya keperawatan komunitas seperti penggunaan variasi metode pendidikan dan promosi kesehatan, intervensi langsung, pemberdayaan pada masyarakat dan lanjut usia, kerja sama lintas sektor, serta merekomendasikan Puskesmas membangun posyandu lansia agar paralansia bisa memperoleh pelayanan kesehatan terutama pada penyakit tidak menular

Kata kunci : Lanjut usia, kejadian pradiabetes, prediktor

BACKGROUND

The total population in Indonesia in 2010 was 23.641.326 people (Statistic Center of Indonesia 2010) and 22 % out of this datum is elderly. The number of elderly people in Riau Province from 2012 to 2014 was high. The aging is a part of life. When people are going through aging process, physiological changes occurs. Metabolism problems are often found in the elderly like diabetes mellitus (Aspiani, 2014). According to American Diabetes Association 2015, people are in risk for prediabetic or diabetes started from 45 years old (Care, Care, Recommendations, & Care, 2015).

Older adults or the elderly are at high risk for the development of chronic illnesses and related disabilities. These chronic conditions include diabetes mellitus, arthritis, congestive heart failure, and dementia (Older Americans 2012). Health People 2020 explained that adults' health has correlation with health behavior. Health behavior include physical activity, self management from chronic disease condition, and disease prevention service . There are changes of behavior that can improve the health of elderly (HealthyPeople.gov, n.d.)

Diabetes mellitus disease does not happen suddenly, but it has a long process. This process runs progressively. Usually, in the aging process, people start to suffer from prediabetic. Individuals with prediabetic have higher plasma glucose than the normal range but has a lower value than that in type 2 diabetes mellitus (Panesar & Hons, 2013). Prediabetic is a state when glucose level is higher than normal, but does not meet the criteria for diabetes (Rumahorbo, 2014). According to the American Diabetes Association, there are conditions in people like Impaired Glucose Tolerance (IGT) and Impaired Fasting Glucose (IFG). The standard value of prediabetic is when blood glucose level is 100-125mg/dl for fasting glucose (called IFG) or 140-199 mg/dl for impaired fasting tolerance (called IGT) (ADA, 2015).

People with prediabetic are usually not aware of their condition

because it generally has no symptoms. According to Rumahorbo (2014), about 2% to 10% people with prediabetic are very likely to have risk of type 2 diabetes mellitus. Five to 10% of people per year with prediabetic will progress to diabetes mellitus (Tabak, Herder, Rathmann, Brunner, & Kivimaki, 2012). Nugroho 2012 in Madsbab 2011 explained that prediabetic prevalence in the world reached 344 million cases. A study by Yunir 2006 in DKI Jakarta found that 24.91% of prediabetic occurred in people at the age of 25 to 64 years (Sovia, Rekawati, & Kuntarti, 2013) and based on the results from secondary data, prediabetic prevalence (based on impaired glucose tolerance data) in Indonesia was 10% (Soewondo & Pramono, 2011). Prediabetic prevalence result of 10% is found in people aged 18 years or older. Meanwhile, a study by Fajriyanti and Ayubi in Padang Panjang 2012 found that prevalence of prediabetic in the elderly was 57.7% (Fajrinayanti; Dian & Ayubi, 2008) and the research in Pekanbaru found that the prevalence was 23.72% (Artanti, Masdar, & Rosdiana, 2015).

Prediabetic in the elderly need a care and prevention, so it would not become a disease and give health negative impact. Soewondo and Pramono (2011) explained that prediabetic people are in a serious condition because they are at risk for diabetes mellitus type 2, heart disease, and stroke. Prediabetic was associated with an increased risk of cancer also (Yi Huang et al., 2014). Health problem in the elderly can be affected by some factors. Sociodemographic factors influence prediabetic. The results of research by Soewondo and Pramono (2011) showed that prediabetic occurrences in Indonesia are affected by social economical status, and it is found that people with high economical status have correlation with prediabetic.

People's health is affected by behavior and life style for 50% (CDC, 2006 in Bremer & Synder, 2014). Disease risk in prediabetic can be prevented by improving

and maintaining health behaviors. This prediabetic condition occurs because of bad health behavior. Behavior of people with prediabetic can be modified by involving physical activity, diet management, and weight management (Panesar & Hons, 2013). The modifiable risk factors are: smoking habit, alcohol consumption, low physical activity, inadequate diet, hypertension, dyslipidemia, and obesity (Díaz-Redondo et al., 2015). Life style such as physical activity and balance diet can prevent or reduce diabetes incident at risk population (Ramachandran, 2012).

The result of previous studies explained that incidence of prediabetic was high on females, elderly whom have partner will give effect to daily compsumtions and knowledge, attitude is domain of behavior. Behavior can be modified by preventive program. This study was aimed to analyze the predictors of prediabetic incidence among elderly.

METHOD

This was a cross sectional study. The approach used was cross sectional. There were 76 respondents in this study. The inclusion criteria were 45-59 years old, willing to be a respondent, able to read and write and did not have diabetes mellitus family hystory. The exclusion criteria was those having diabetes mellitus. The data were collected using a set of questionnaires to measure the sociodemographic and health care behavior toward incidence of prediabetic. The questionnaires had been tested for validity and reliability with score (0.444; 0.60). For criteria of prediabetic were 100-125 mg/dl prediabetic. The glucotest was used to identify the prediabetic incidence.

The statistical analysis used SPSS 17 with significance level (significance) $p < 0.05$. The researcher test the univariate to find mean, median, SD, frequency, and precentage. The analysis of the relationship of sociodemographic and health care behavior of the elderly toward incidence of prediabetic used chi-square test. The logistic regression model

was used to identify the predictors of incidence of prediabetic.

RESULTS

Incidence of prediabetic in the elderlies

The dependent variable was incidence of prediabetes. The majority of respondents were normal or did not have prediabetic (64.5%). A detailed information is shown in table 1.

Table 1. Distribution of respondents by incidence of prediabetic

	F	%
Not Prediabetic	49	64.5
Prediabetic	27	35.5

Sociodemographic and health care behaviors

The independent variables were gender, marital status, education, knowledge, attitude, practice, and health care behaviors. The majority of respondents (61.8%) were female, were married (86.8%), and were had a lower level of education (45%), have high knowledge (78.9%) have negative attitude (85.5%), had bad practice (65.8%), and ineffective health behavior (68.4%). More information can be seen in table 2.

Table 2. Distribution of respondents by gender, marital status, education, knowledge, attitude, practice and behavior

Variables	F	%
Sociodemographic		
Gender		
Male	29	38.2
Female	47	61.8
Marital Status		
Single	10	13.2
Married	66	86.8
Education		
Low	45	59.2
High	31	40.8
Knowledge		
Low	16	21.1
High	60	78.9
Attitude		
Negative	65	85.5
Positive	11	14.5
Practice		
Bad	50	65.8

Variables	F	%
Good Behaviors	26	34.2
Not Effective	52	68.4
Effective	24	31.6

Bivariate analysis

Based on the examination, there was no significant difference for gender toward the incidence of prediabetic. It was obtained that 63% of females have prediabetic. This number was higher than male (37%). It means that there was no difference among female and male (p value 1,000). For marital status, there was no significant difference toward incidence of prediabetic. It was found that 85.2% of married people have prediabetic. This percentage was higher than the single one (14.8 %). It means that there was no difference among married and single (p value 1.000). And for education, there was no significant difference toward incidence of prediabetic. It was obtained that 55.6% of people with lower education have prediabetic. It was higher than those who have higher education (44.4%). It means that there was no difference among low educated and high educated people (p value 0.812). More information can be seen in table 3.

Table 3. Results of bivariate selection of sociodemographic and health care behaviors toward incidence of prediabetic

Variable s	Incidence			OR	p
	Not predia bets	Predi abetic	Total		
	F / %	F / %	F / %		
Gender					
Male	1/38.8	10/37	29/38.2	1,07	1,00
Female	49/61.2	17/63	47/61.8	7	0
Marital status					
Single	6/12.2	41/14.8	10/13.4	1,0	0,80
Married	43/87.8	23/85.2	60/86.6		
Educatio n level					
Low	30/61.	15/55.	45/55	1,26	1,00

Variable s	Incidence			OR	p
	Not predia bets	Predi abetic	Total		
	F / %	F / %	F / %		
	2	6	9.2	3	
High	19/38.8	12/44.	31/44		
	8	4	1.8		
Knownle ge					
Low	10/20.4	6/22.2	16/22.2	0,89	1,00
High	39/38.8	21/77.	60/78.9	7	0
Attitude					
Negative	44/89.8	21/77.	65/85.5	0,10	0,00
Positive	5/10.2	6/22.2	11/14.5	3	3
Practice					
Bad	32/65.3	16/66.7	50/65.8	0.30	0.02
Good	17/34.7	19/33.3	26/34.2	2	9
Behavior s					
Not Effective	34/69.4	18/66.7	52/66.4	0.53	0.01
Effective	15/30.4	9/33.3	24/31.6	1	2

There was a difference between negative and positive attitude on prediabetic chance (P value =0.003). The elderly with negative attitude have 0,10 times of chance to be prediabetic in the future (OR=0.103; 95% CI 0.076-0.319). There was a difference between bad and good practice on prediabetic chance (p value = 0.029). The elderly with bad practice have 0.30 times of chance to be prediabetic (OR= OR= 0.302; 95 %CI 0.086-0.357). The three domains of behavior were combined as behaviors of the elderly. There was a difference between ineffective and effective behavior on prediabetic chance. The elderly with ineffective behaviors have 0.53 times of chance to be prediabetic (OR= 0.531; 95 % CI 0.217 - 0.639). A detailed information is presented in table 3.

Multivariate analysis

This analysis used a multivariate to examine the predictors of incidence of

prediabetic. The analysis showed two most predictive variables. They were attitude (p value = 0.163), and practice (p value = 0.220). More information is presented in table 4.

Table 4. Results of bivariate selected variables associated with incidence of prediabetic

Variables	X ²	P
Sociodemographic		
Gender	0.22	0.881
Marital status	0.099	0.751
Education	1.027	0.631
Healthcare behaviors		
Knowledge	0.034	0.897
Attitude	1.948	0.163*
Practice	1.027	0.220*

The regression logistic test was used to analyse the predictors of prediabetic incidence. The researcher input the independent variables which had significant p-value (<0.05) in bivariate test. More information is presented in table 5.

Table 5. Final model of multivariate analysis of logistic regression

	P	OR	95% for CI exp (B)	
			Lower	Upper
Step 1				
Attitude	0.163*	2.514	0.688	9.186
Practice	0.222*	1.576	1.89	1.973
Step 2				
Attitude	0.004*	5.562	0.695	13.446
Practice	0.12	0.876	0.316	2.409

The logistic regression test showed that the elderly with negative attitude have 5 times of chance to be prediabetic compared with positive attitude about health care behaviors was (OR = 5.562, p<0.05).

DISCUSSION

Univariate statistical analysis showed that the incidence of prediabetic was 35.5%. It was higher in the elderly. The result of this study was higher than the value in other research. Prediabetic incidence can be caused by many factors. According to Nies, as people get older,

approximately 20.7% (Nies & McEwen, 2007) the elderly will suffer from pain. This condition improves blood sugar level. According to ADA 2015 the reduction and ineffectiveness of insulin total in blood can cause prediabetic. The result this study may raise awareness, because there are many negative impacts in the body such as an increased risk of composite cardiovascular disease (Yuli Huang, Cai, Mai, Li, & Hu, 2016)

The next analysis of the questionnaire results is negative attitude. This negative attitude is seen from diet or physical activity aspect. The aspect of diet is a negative attitude that can be seen from the elderlies' meal time management which is considered unimportant; it is enough to eat only when they feel hungry; they eat hot rice in a big portion and there is no effect on health condition; and consuming too much snacks does not influence prediabetic. This study was showed that have same in the rural china such as lack of attention paid to diet control (51.4%),irregular diet (3.9%) (Luo et al., 2018)

The aspect of physical activity showed negative attitudes such as schedule for exercise which is only once a week, exercise is not a routine activity, walking and gardening are not physical activities, and schedule of physical activities is not necessary. Physical activity was associated with decreased fasting glucose of 0,5 mg/dl (Farni et al., 2014). Notoadmodjo 2014 explained that attitude towards health is a form of people assessment related to their health. It can be seen from biv ariat analysis that the elderly in Keritang District have negative attitudes toward health care behavior which is shown by high incidence of prediabetic. It can be seen from opportunity value OR (95% CI) that the elderly with negative attitudes have 0.10 times of chance compared with those with positive attitude.

Based on the results, it is assumed that the elderies' attitude influences health status. The elderlies' negative attitudes are not influenced by

knowledge. The possible cause is that the elderly only know and understand but they do not practice, analyze, or evaluate it. The elderlies' negative attitudes are not caused by the absence of mind but by unawareness so that there is no motivation or enthusiasm which leads to negative attitudes and high risk of prediabetic. The problems can be addressed with positive attitudes and prevention, especially for non communicable disease. Prevalence of non communicable diseases was on the higher in the rural area such as diabetes mellitus 9,2 % (Htet et al., 2016) and prevalence of diabetes in the geriatric population 25.2% (Kandpal, Kakkar, Aggarwal, & Bansal, 2013).

Conclusions: The elderlies' negative attitudes are challenges for nurses particularly when giving education and health promotion, and forming training team for physical activities. Therefore, physical activities can be done for more optimum prediabetic prevention.

The multivariate analysis showed that the elderlies' attitudes have high contribution to incidence of prediabetic in Keritang Riau. The further analysis showed that the elderlies' negative attitudes have 5 times of chance to be prediabetic compared to those with positive attitudes. The results of reaseach by Saam and Wahyuni 2012 showed that attitude will be a predisposition factor of how someone behaves especially in health that can be influenced by education (Notoadmodjo, 2014). It can be seen by 59.25% of the elderl have low education level.

The elderlies' negative attitudes can be a dominant factor of prediabetic incidence. It could be affected by several factors such as the elderly rarely left for another place, they only do their activities around their village. Consequently, their experiences about health care have not changed. They think narrow mindedly about their health condition. They visit health center when they have health problem.

CONCLUSION

The elderlies' attitudes toward health care behavior predicted prediabetic incidence. Attitude is the most dominant variable of prediabetic incidence among elderly.

RECOMMENDATION

It is recommended that Public Health Center optimized the existing programs such as making changes in health promotion and education by conducting FGD; community empowerment or prevention of prediabetic, building health center for elderly to prevent communicable diseases, so that they will be more aware of their health condition, do exercises at home, have diet management, and when there is problem with their body, they can immediately visit the health care service.

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