

An Analysis of Depression and Self-management in Individuals with Diabetes Mellitus

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Abstract: Depression can inhibit DM patients to manage DM. This study aimed to see the relationship between depression and self-management in individuals with DM. This study used quantitative methods and the sampling technique was purposive with 150 patients with type 2 DM the subject, consisting of 50 men and 100 women. The Beck Depression Inventory-II (BDI-II) was used to measure depression and the Summary of Diabetes Self Care Activities (SDSCA) was used to measure self-management of DM patients. Data analysis used Pearson product-moment correlation with the results of correlation coefficient (r)= -0.390 and $p > 0.05$. These results indicate that there is a negative relationship between depression and self-management in individuals with DM. This means that the higher the depression level of DM patients, the lower the level of self-management or vice versa. The majority of depression levels of DM patients are categorized as low (28%) and the majority of self-management is in the low category (50.7%).

1 INTRODUCTION

Diabetes mellitus (DM) is a disease found in all countries and becomes the 4th cause of death in the world (Banna, 2017). DM becomes one of threats against global health which is caused by the increase of its sufferer number (World Health Organization in PERKENI, 2015). International Diabetes Federation (IDF, 2014) stated that more than 371 million individuals around the world suffered from DM in 2012. In 2015, there were around 30.3 million people with DM in the world (Centers for Disease Control and Prevention, 2017).

The rise of the number of DM sufferers in Indonesia was also revealed by The Indonesian Central Bureau of Statistics (BPSI), that Indonesian people with DM type 2 prevalence in urban area was for 14.7% and in rural area was for 7.2%, it estimated that the number of Indonesian suffering from DM type 2 would increase to be 12 million sufferers in 2030 (Sudaryanto, Setiyadi, & Frankilawati, 2014).

DM prevalence in Aceh reached 1.7% in 2007 and increased to be 1.8% of around 5 million of Aceh people (Bureau of Health Research and Development, 2008; Bureau of Health Research and Development, 2013). The number was nationally

high, thus in 2017 Aceh stood on 5th position of DM suffering number nationally after Maluku on 1st and other 3 provinces (Antara, 2013; Bakri, 2017).

The high DM patient prevalence in Aceh is caused by the high risk factor i.e. unhealthy life pattern such as diet pattern, obesity, less physical exercise and activity (Antara, 2013). DM is a chronic disease occurring when pancreas does not produce enough insulin (a hormone to control blood sugar levels) or if body cannot effectively use produced insulin, the concentration of glucose in blood will rise (WHO, 2010). According to Tandra (2008), DM is disease happening when a body cannot effectively produce insulin or respond to insulin or both, which needs proper and serious treatment.

DM consists of type I and type II (WHO, 2010). In addition, there are also Malnutrition-related DM caused by disorder or lack of food (malnutrition), DM during pregnancy and DM among individual having normal glucose levels however having great risk suffering the DM (WHO in, Tobing, Mahendra, Krisnatuti, & Alting, 2008).

DM type I is caused by lack of insulin production which requires insulin injection as a treatment in the daily basis and usually happens at young age, while DM type II is caused by ineffective insulin role inside the body and being

able to be treated by consuming oral medication, DM type 2 usually occurs at older age beyond 40 (WHO, 2010). According to Suyono (In Sudaryanto, Setiyadi, & Frankilawati, 2014), DM type II can be caused by obesity or unhealthy diet pattern like amount and composition of consumed food, resulting in damage in tissue or organs.

DM type II is the most found type in all countries and usually happens among 45-year-old individuals, however it may happen at age over 20 (Putri & Isfandiari, 2013). Around 90% of DM sufferers around the world suffering from DM type II (WHO, 2010). If DM patients cannot change their life style to avoid bad impact of DM like regular exercise, diet, avoiding cigarette and alcohol, regular check and drug consumption, the patients can suffer from stress, frustration, declining of self-control and depression (Bailey, 1996; Clark, 2005). As Glasgow, Fisher and Anderson explained (1999), that DM was the main source of behavioral problem and psychosocial disorder.

According to Barnard, Skinner and Prevelar (2006), patient with DM is three times as high as patient without DM to suffer from depression. Result of study by Hasanat (2015), showed that there was the different depression based on the length of patient in suffering DM, patients suffering DM for 16-20 years suffered depression higher than those suffering DM for more than 20 years. Depression prevalence is also higher among patients with DM who suffer from long-term complication (Raval, Dhanaraj, Bhansali, Grover, & Tiwari, 2010). Patient with DM type 2 who has been diagnosed also experiences the rise of depression symptom risk for 1.7% comparing to DM patient without diagnosis (Knol, Heerdink, Egberts, Geerlings, Gorter, Numans et al., 2007).

DM patients suffering from depression will experiences negative mood, loses passion or pleasure to do usual activities which will inhibit DM patient to manage their DM (Clark in Clark, 2005). DM patients with depression frequently experience low life quality, low obedience toward medication and low glycemic control which arouse risk of DM complication (Gavard, Lustman, Clouse, 1993; Peyrot & Rubin, 1999; Clark, 2005). DM patients with depression have been proven to have worse self-management, disobedience toward medication, and higher risk factors of cardiovascular diseases like smoking, obesity and unhealthy life style which tends to settle like bad diet pattern and lack of physical activity (Raval et al., 2010).

DM management is necessary to do to assist DM patient in normalizing glucose levels in blood,

avoiding acute complication and other bad impacts (Hasanat, 2015; Hill-Briggs, 2003). Self-management has been confirmed as main mediator to manage DM effectively as more than 95% of DM treatments are in form of self-management (Fearon-Lynch & Stovmer, 2015).

Self-management can assist DM patient to maintain blood sugar levels to stay at normal level (Drury in Goodall & Halford, 1991). Self-management intends to reduce disease impact toward status and function of physical health and allow individuals to solve psychological impact of the disease (Lorig & Holman dalam Nolte & McKee, 2008). In addition, self-management skill in DM patients can raise patients' well-being (Cramm, Hartgerink, Steyerberg, Bakker, Mackenbach, & Nieboer, 2013). Self-management helps DM patients to control medication, keep life role and manage negative emotion like fear and depression (Lorrig, Sobel, Ritter, Laurent, & Hobbs, 2001).

Self-management on DM is a sustainable process to facilitate DM patient related to knowledge, skills, and ability required for self-treatment against diabetes (Funnell, Brown, Childs, Haas, Hosey, Jensen et al, 2012). According to Toobert and Glasgow (1994), Self-management on DM is an implementation of healthy life pattern which results in better control on DM metabolic to help avoid acute complication and long-term DM.

Result of the research by Hasanat (2015), showed that self-management was influenced by psychological factors like self-efficacy and depression. The researcher added that depression directly related to self-management and became a mediator for other psychological factors, as follows self-efficacy, social support and expressed-emotion. Surwit and Bauman (2004), stated that DM patients who were depressed would affect the patients in implementing self-management. Wagner, Tennen and Osborn (2010), mentioned that depression could be linked to self-management on DM, such as the low obedience toward diet, physical exercise, medication and the low blood sugar control. Based on the facts, the present research is important to conduct because depression is a common psychological problem among DM patient and can decrease the vigor of patients to undergo slow medication (Watkins in Winasis & Maliya, 2009). Surwit and Bauman (2004), stated that depression on DM patients would affect their self-management. DM patients with depression has been proven to have bad self-management, therefore it results in disobedience toward medication, raise risks factors of cardiovascular diseases like smoking, obesity, and

adherent life style (Raval et al., 2010). DM self-management assists patients to normalize glucose levels in blood, avoid acute complication and other bad impacts (Hasanat, 2015; Hill-Briggs, 2003).

2 METHOD

This research used quantitative approach with correlational research. Samples characteristics as follows:

- a. Individual with diagnosis of DM type 2
- b. 40 to 75-year-old and suffer from depression
- c. One had been diagnosed at least for a year, so one has undergone self-management.
- d. Undergoing medication in the latest week

In this research, the researcher had certain characteristics for research subjects. Total samples were 150 who were from several regions in Aceh. Instruments in the research were Beck Depression Inventory II (BDI-II) to measure depression and the Summary of Diabetes Self-Care Activities (SDSCA) to measure self-management.

This research was conducted in 150 subjects with DM type 2, age 40 to 75-year-old in Aceh. Data was collected in several areas i.e. Endocrinology Polyclinic in dr. Zainoel Abidin General Hospital, Restu Ibu Health Clinic and home visit.

Table 2.1. Demography Data of Subjects

Description	Total (N)	Percentage (%)
Age		
40-65	121	80.7
66-75	29	19.3
Sex		
Male	50	33.3
Female	100	66.7
Marriage Status		
Married	114	76
Unmarried	1	0.7
Widower	12	8
Widow	23	15.3
Educational Level		
Never Going to School	1	0.7
Kindergarten	2	1.3
Primary school	47	31.3
Junior High School	22	14.7
Senior High School	42	28
Diploma	4	2.7
Bachelor	26	17.3
Master	6	4
Occupation		
Civil servant	29	19.3
Private Sector	17	11.3
Laborer	2	1.3
Lecturer	2	1.3
Lecturer	4	2.7
Teacher	1	0.7
Fisherman	5	3.3
Farmer	5	3.3
Merchant	2	1.3
Entrepreneur	2	1.3
Rickshaw Driver	1	0.7
Builder	11	7.3
Pensioner	69	46
unemployment		
The length of suffering DM		
1-10 years	112	74.7
11-20 years	36	24
21-25 years	2	1.3

3 RESULT

3.1. Analysis

Descriptive analysis was conducted to see description of hypothetical data (if it happens) and empirical data (based on the reality) from the

depression variable. Research subject category of depression scale was standard category arranged by Beck (1996) containing four categories, as follows high, moderate, low and mild. Based on those categories, the category of DM patient subject in depression scale can be seen in table 3.1 below:

Table 3.1. Categories of Depression in DM Patients

Ordinal Categorization	Category	Total	Percentage %
29-63	High	39	26
20-28	Moderate	37	25
14-19	Low	42	28
0-13	Mild	32	21.3

Subject category in self-management used ordinal category formula as mentioned in table 2.3

Table 3.2. Norm Formula of Self-Management Category

Ordinal Categorization	Category
$X \geq (\mu + 1.0 \sigma)$	High
$(\mu - 1.0 \sigma) \leq X < (\mu + 1.0 \sigma)$	Moderate
$X < (\mu - 1.0 \sigma)$	Low

Description:

μ = Theoretical Mean

σ = Standard Deviation

X = Observed Score

Based on Category norm in table 2.3, Category distribution of self-management variable consist of high, moderate and low. Categorizing can be seen in table 3.3.

Table 3.3. Category of Self-Management in DM patient

Ordinal Categorization	Category (%)
$X \geq (\mu + 1.0 \sigma)$ $X \geq (500 + 167)$ $X \geq 667$	High (13)
$(\mu - 1.0 \sigma) \leq X < (\mu + 1.0 \sigma)$ $(500-167) \leq X < (500 + 167)$ $333 \leq X < 667$	Moderate (48)
$X < (\mu - 1.0 \sigma)$ $X < (500 - 167)$ $X < 333$	Low (50.7)

Result of hypothesis test showed that coefficient score was (r) = -0.390 and signification score in this research was p=0.000 (p<0.05) which showed that there was negative relationship between depression and self-management in DM type 2 patients. Based on the hypothesis test result, it can be concluded that there was significant relationship between depression and self-management in DM type 2

patients. The negative relationship shows that the higher depression level is, the lower self-management level of DM type 2 patients. Conversely, the lower depression level is, the higher self-management level of DM type 2 patients is. Therefore, hypothesis of this research was accepted because there was the relationship and lower significance score than p=0.05, between depression and self-management in DM type 2 patients.

3.2. Discussion

Negative result of correlation test in this research is in accordance with Gonzalez, Peyrot, McCari, Collins, Serpa, Mimiaga and Safren (2008) as well as Raval et tal., (2010), that individual with depression symptoms has low DM self-management, like low obedience in term of diet, medication, and lack of physical exercise and blood glucose check up, moreover the individual also has higher risk factor of cardiovascular diseases, enhance smoking habit, obesity and unhealthy life. According to Toobert and Glasgow (1994), self-management is application of healthy life pattern which will result in better control of DM metabolic to help avoid acute and long term complication of DM. Individuals with depression will be hopeless and helpless to control their behavior including implementation of health life pattern (Rehm, 1990). Depression emerges when pressure and stress come caused by displeasing circumstances then results in negative perception on oneself, life and future (Beck dkk., 1999). Negative perception can influence self-regulation process which is foundation of self-management against chronic diseases (Bandura, 1991; Berg, 2014).

Interesting matter of this research is the discovery that depression measurement showed the majority of subjects suffered from low level depression for 42 subjects (28%) and self-management measurement showed that the majority of subjects had low self-management level for 76 subjects (50.6%). Based on R-squared score or coefficient of determination, coefficient score was 0.152, the score showed that depression had effect on self-management for 15.2%, while the rest was (84.8%) affected by other factors. The total of coefficient of determination was range from 0-1, the lower coefficient of determination score is, the lower the effect of independent variable on dependent variable is. Conversely, if coefficient of determination score gets closer to 1, the effect of independent variable on dependent variable will be higher.

Majority of low depression level could be caused by the existence of free health care which functions as protecting factor against depression for DM patients (Dunlop, Song, Lyons, Manheim, & Chang, in Devarajoo & Chinna, 2017). According to demographic data of this research, there were 23 subjects (15.3%) suffered from low level depression who were working subject. Low self-management of DM patients is related to patients' low understanding about health, bad disease monitoring, and increasing complication (Schillinger, Grumbach, Piette, Wang, Osmond, Daher et al., 2002). It is in accordance with this research, subject explained that they did not only undergo treatment for DM, but also undergo treatment for DM complication like heart disease treatment, treatment for unhealed wound on the body, kidney treatment, and thyroid treatment. Schulman-Green et al. (2012), stated that complication or so-called comorbidity can influence the effectiveness of DM self-management. Comorbidity is the presence of one or more chronic conditions in DM patients who also suffer from heart disease, retinopathy, nephropathy, and wound in DM patient's leg (Rashid, Anandhasayanam, Kannan & Noon, 2015). According to Hasanat (2015), accumulation of glucose in blood is main cause of DM comorbidity (complication).

Based on demographic data of subjects in this research, it can be seen that the subjects had low self-management whose latest education mostly at senior high school for 22 subjects (14.6%), age under 60 years for 49 subjects (32.6%) and female for 53 subjects (35.3%). Research by Maneze, Everett, Astorga, Yogendran, and Salamonson (2016), found that low self-management could be caused by low educational level, lack of knowledge on self-management for diabetes, experiencing depression, and age under 60, because old patients had high awareness of death and health became main focus, moreover, older patients had more time to self-manage because they had less priority than younger patients.

Research by Chlebowy, Hood and LaJoie (2013), found that there was different self-management for DM between male and female, in which female had some obstacles to do self-management for DM, the obstacles were difficult to receive diagnosis, did not work so that lack of fund, embarrassment, negative thinking toward the disease and afraid of the bad impact of consumed drug. Failed self-regulation is also related to low self-management, like bad obedience toward treatment and low metabolic control (Berg et al., 2014; Hughes, Berg, & Wiebe, 2012). Furthermore, research by Hasanat (2015),

found that self-efficacy had positive relationship with self-management among DM type 2 patients, it meant that self-efficacy could reveal self-management level of DM patients.

According to this research result, based on age, it showed that 11 subjects (7.3%) aged 66-75 years old suffered from high level depression. The result is in accordance with an explanation by Black, Markides and Ray (2003), that older patients have higher risk to suffer from either moderate or high depression and the development of depression is five times faster at the age. The same thing is mentioned by Berge, Riise, Tell, Iversen, ostbye, Lund and Knudsen (2015), that individual aged 70s with DM disease history slightly increase depression prevalence, meanwhile individuals aged 40s with DM disease history had depression level twice as high as individual without DM. There are several risk factors which were known can enhance the possibility of an older individual to develop depression, the factors are chronic diseases, medication, bearing a lot of loss, declining physical and cognitive function, or both, depression history, losing friends and important others and losing job (US Department of Health and Human Services, in Cahoon 2012). Based on sex, majority subjects suffering from depression were female for 100 subjects (66.7%), 31 of whom were at high depression category (20.6%). Anderson, Freedland, Clouse and Lustman (2001), stated that depression commonly happened to female DM patients rather than male. A research conducted in Brazil by Dessotte, Silva, Furuya, Ciol, Hoffman and Dantas (2015), found that depression among female could be caused by biological aspect like hormone transformation during reproduction or menopause period, as well as social aspects like role in society and family, greater workload than male, doing carrier along with household duty (taking care kids, husband and sick family members), having lower educational level and lower salary than male.

Further analysis found that there were 23 female subjects who had high depression had low self-management. According to Mathew, Gucciardi, De Melo and Barata (2012), comparing to males, females consider DM as negative disease which can affect their lives, like decreasing of husband-children-caring ability as well as inhibiting usual activities, so that the depression among females can decline obedience toward medication (self-management). Research by Uden, Elofsson, Andreasson, Hillered, Eriksson and Brismer (in Chlebowy, Hood, & LaJoie, 2013), found that females had worse mental health than males and

males were less worry on DM and had better self-management and females.

Based on marriage status, it found that subjects without partner, like never married, widowers and widows, had the highest depression level which were at high category for 15 subjects (10%). In accordance with research by Wade, Hart, Wade, Bajaj and Price (2013), that if compared to individuals with partner, individuals with chronic disease already left by their partners would suffer from frustration, fear, anger, anxiety and depression. Moreover, depression can be triggered by worrying situation occurring in individuals' lives, particularly the events which involve loss, the loss of family member or friend (Borrill, 2000). A main social factor which cause depression is marriage status and several studies showed that married individuals had better mental health than unmarried individuals, widowers and widows (Bulloch, Williamsa, Lavorato, & Pattena, 2017).

According to analysis result, it was found that there were 69 subjects (46%) were jobless. Social and economic status mostly influence individual's mental health, those who have high income, high education and occupation are likely to be happy and less depressed or less experience other mental problems (Clark, Frijters, & Shields, 2008; Diener & Biswas-Diener, 2002; Frey & Stutzer, 2002; Lorant et al., 2003; dalam Jokela & Jarvinen, 2011). Furthermore, social and economic status become factors that can influence the effectiveness of self-management among DM patients. Social and economic status are related to cost which should be expensed by patients to treat long-term disease (Schulman-Green et al., 2012). It is in accordance with this present research that majority subjects do not had permanent job, they were housewife and private sector workers. It made subject difficult to get fund for their treatment and for DM self-management. Although Aceh and several other provinces have health care facility to help cut medication cost, patients must pay dues monthly and there are certain medications which must be paid with their own cost (Healthcare and Social Security Agency, 2017).

4 CONCLUSIONS

This study aimed to know the relationship between depression and self-management in DM patients. The result showed that there was the relationship between depression and self-management in individuals with DM. Further analysis showed that

majority of DM patients had low depression and self-management level. Moreover, from each variable is known that there are several factors which can influence depression and self-management, as follows age, sex, marriage status, economic status and comorbidity.

Family becomes the nearest media for DM patients to help and support them in order that they are able to avoid depression and improve their self-management. Therefore, family has to support and provides motivation for DM patients in order to be able to self-adjust with negative impact emerging because of the disease.

Future researcher who will study about depression and self-management is expected to extend or conduct further analysis about the relationship between depression and self-management. Furthermore, the future research is expected to extend research samples in both variables, research is not only conducted in DM patients, but also patients with other chronic diseases in order to enrich research result with similar variables.

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