Diabetes Self-Management and Its related Factors

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Abstarct

Self-management is essential in preventing complications among patients with Diabetes Mellitus. The behaviour of patients to implement Diabetes Self-Management (DSM) is influenced by several factors which needs further study. This descriptive study aimed to identify factors contributing to DSM among patients with Type 2 Diabetes Mellitus (DMT2). 94 respondents were recruited using randomized sampling obtained from an inpatient unit in one hospital in West Java province. Self-rating instruments were used to identify demography data, knowledge about DSM, self-efficacy scale, and DSM questionnaire. Descriptive analysis was conducted to explain demography data, knowledge, self-efficacy and DSM. Findings indicated respondents demonstrated moderate level of knowledge (M=7,53), and self-efficacy (M=34,8), and high level of DSM (M=89,28). Post-hoc analysis demonstrated a significant relationship between age (r=-0,209); p=0,043), education level (p=0,008), and self-efficacy (r=0,214; p= 0,038). No significant relationship was not identified with DSM (r=0,317; p=0,187). It is concluded that age, level of education, and self-efficacy were contributed to DSM.

Keywords : Contributing factors, diabetes mellitus, self-management.

Manajemen Diabetes dan Faktor-Faktor yang Memengaruhi

Abstrak

Self-management adalah komponen penting dalam pengelolaan dan pencegahan komplikasi pada pasien diabetes mellitus. Perilaku pasien dalam menjalankan DSM dipengaruhi oleh banyak faktor. Penelitian ini ditujukan untuk mengidentifikasi faktor yang berkontribusi terhadap DSM pada pasien dengan diabetes mellitus tipe 2 (DMT2). Penelitian diskriptif ini melibatkan 94 pasien DMT2 yang direkrut secara *random* di Poli DM salah satu rumah sakit daerah di Jawa Barat. Responden diminta untuk melengkapi kuesioner yang mencakup data demografi; kuesioner singkat pengetahuan tentang DSM (15 item; skor 0 – 15); *self-efficacy scale* (12 item; skor 12 – 48); dan kuesioner DSM (29 item; skor 29 – 116). Analisis deskriptif diterapkan untuk menjelaskan data demografi pasien, tingkat pengetahuan, *self-efficacy*, dan DSM. Adapun analisis hubungan diterapkan untuk mengidentifikasi faktor DSM. Hasil penelitian mengindikasikan bahwa secara umum responden menunjukkan pengetahuan (M = 7,53) dan *self efficacy* (M = 34,8) tingkat sedang, serta melaporkan tingkat DSM yang tinggi (M = 89,28). Analisis lanjut menemukan adanya hubungan yang bermakna antara usia pasien (r = -0,209; p = 0,043), tingkat pendidikan (p = 0,008), dan *self-efficacy* (r = 0,483; p = 0,000) dengan DSM. Tingkat pengetahuan secara bermakna berhubungan dengan *self-efficacy* (r = 0,214; p = 0,038), namun tidak menunjukkan hubungan yang bermakna dengan DSM (r = 0,137; p = 0,187). Disimpulkan bahwa usia pasien, tingkat pendidikan, dan *self-efficacy* berkontribusi terhadap DSM.

Kata kunci : *Contributing factors*, diabetes mellitus, *self-management*.

Introduction

The high prevalence of diabetes mellitus (DM) and its' related complications suggest that DM is a serious health problem worldwide and in Indonesia. One report suggested that diabetes prevalence in Indonesia almost 7% of total population and caused 6% of all death in all age (World Health organization [WHO], 2016). The Ministry of Health of the Republic of Indonesia [MOHRI] (2014) reported that the percentage of cases in Indonesia increased from 1.1% in 2007 to 2.4% in 2013.

Diabetes related complications such as retinopathy, nephropathy, peripheral neuropathy (PN), coronary heart diseases, peripheral vascular diseases (PVDs), amputation and psychological impairment are also considered to be serious problems. The accumulated problems produce high financial burdens and reduce the quality of life of diabetes patients (Abdelgadir, Shebeika, Eltom, Berne, & Wikblad, 2008). An effective strategy to minimize DM related complication involves improving patients' ability in performing diabetes self-management (DSM) and includes diet, exercises, foot care, and medication (Williams & Pickup, 2004). It has been widely reported that the improvement of DSM positively enhances patients' clinical condition and their quality of life (Fan & Sidani, 2009).

Unfortunately, many Indonesian diabetic patients only partly perform the expected DSM. They partially disobey the diet program, foot care, medication or physical activity and exercise (Primanda, 2011; Sae-Sia, Maneewat, & Kurniawan, 2013).

Studies found that there were many factors contributing to DSM. It suggested that patients with older age, higher self-management knowledge, self-efficacy, and higher social support as well as had experience on foot care education program were performed better diabetes self-management. Oppositely, longer diabetes duration and hospitalization experiences were identified as inhibiting factors (Huang, Zhao, Li, & Jiang, 2014; Mahfouz & Awadalla, 2011; Kurnia, Amatayakul, & Karuncharernpanit, 2015; Sonsona, 2014). One literature review also revealed that age, social support, educational level, economical status, and duration being diagnosed DM as

contributing factor of DSM (Abrahim, 2011).

Preliminary study in one district hospital in West Java which develop specific Diabetes Out-Patients services found that hospital developed regular services supported program including health education regarding DSM, develop diabetes patients support group (PERSADIA – Persatuan Diabetes Indonesia), weekly diabetes exercise, etc. Unfortunately, some patients reported that they had been hospitalized twice/year because of DM complications. Some patients also reported that they strictly consumed or injected insulin as programmed and disobey the diet however. Therefore, it is essential to identify the current degrees of patients' competence in DSM and the factors that contribute to it among diabetic patients who attend in this out patients department.

Methods

This descriptive-correlational study was conducted with 94 patients with Type 2 Diabetes mellitus (T2DM) who visit the out-patients department of a district hospital in West Java Indonesia 2012. They were approached and recruited accidentally during one month data collection conducted. Informed consent was sought and obtained from all patients. The researcher talked with each patient prior to their participation to explain the purpose and details of the study. They were reassured about confidentiality by explaining that all data were kept confidentiality by applying anonymity.. The patients were allowed to make a free, independent choice concerning informed consent and could refuse to take part and make an informed choice without coercion. The patients were also allowed to ask any questions related to the study and ask question at any time and had the right to withdraw from the study at any time without penalty.

The data were collected using questionnaires that sought patients' demographic data, brief DSM knowledge, self-efficacy, and DSM behaviors. All questionnaires were developed by the researcher based on relevant references. The brief DSM knowledge questionnaire consisted of 15 items asking about patients' knowledge related to DM and its management. The self-efficacy questionnaire consisted of

12 items that asked about patients' confidence in performing some abilities related to DSM. The DSM questionnaire consisted of 29 items based on the Indonesian consensus of T2DM control and prevention 2011 (PERKENI, 2011). The questionnaire has been tested and revealed inter-item correlation score as 0.385-0.797 and Alpha Chronbach 0.93 (Handayani, Yudianto, & Kurniawan, 2013). The letter of permission from the RSUD Sumedang hospital (a district hospital in West Java, Indonesia) was received. The data collector then approached the patients and explained how to complete the questionnaires; the completed questionnaires were collected after. All the completed data were coded and analyzed. Descriptive analysis was used to describe the patients' demographic data and each variable identified. The normality test suggested that the data relating to DSM, age, knowledge, and self-efficacy were normally distributed,. Then a parametric test (Pearson product moment) was applied to test the relationship between these variables. However, the duration of diagnosed DM was not normally distributed, therefore the Rank Spearman test was applied to analyze the relationship between DSM and the duration patients' had been diagnosed with DM.

Results

Patients' Characteristic

Generally, patients reported that they had already received information about DM and its management (91.5%); most were married (84%) and female (81.9%). More than half of them (61.7%) were younger than 60 years old and just over a half (57.4%) had middle and high educational levels.

Knowledge, Self Efficacy, Diabetes Self-Management (DSM)

Compared to the maximum total score for each variable, patients showed intermediate levels of DM knowledge (M = 7.53, SD = 2.61) and self-efficacy (M = 34.8, SD = 3.98). A high level of DSM (M = 89.28, SD = 10.20) was reported.

Table 1 Patients' Characteristic (n = 94)

Patients' Characteristic		(*f*)	(%)
Age	< 60 years old	58	61,7
	≥ 60 years old	36	38,3
Gender	Male	17	18,1
	Female	77	81,9
Marital Status	Married	79	84
	Divorce/Single	15	16
Level of Education	Elementary	40	42,6
	Junior High School - University	54	57,4
Acquired DM Information	Acquired Information	85	90,4
	Never acquired DM information	9	9,6

Table 2 Mean and Standard Deviation of Age, Self Efficacy, Knowledge, and SMDM Behaviors (n = 94)

Indicators	Mean ()SD	Min-Max
Duration of being diagnosed DM (years)	5,96 () 5,93	0,3 – 26
Knowledge (Score 0 – 15)	7,53 () 2,61	0 – 14
Self Efficacy (Score 12 – 48)	34,8 () 3,98	21 – 46
DMSM behaviors (Score 29 – 116)	89,28 () 10,20	62 – 113

Table 3 Relationship between DSM and patients' Age, Duration of DM, Knowledge, and Self Efficacy

	DSM	Patients' Age	Duration of Diagnosed DM	DM knowledge	Self-efficacy
DSM	-	-.209 (p = .043)*	.144 (p = .273)	.137 (p = .187)	.483 (p = .000)**
Patients' Age		-	.233 (p = .031)*	-.085 (p = .413)	-.008 (p = .40)
Duration of Diagnosed DM			-	.181 (p = .081)	.181 (p = .212)
DM knowledge				-	.214 (p = .038)*
Self-efficacy					-

(*) Statistically significant at p < .05, (**) Statistically significant at p < .01

Table 4 Relationship between DSM and Patients' Educational Level

Variable		p
Patients' level of education DSM	-2,707[b]	.008

Contributing Factors to DSM

The analysis found that DSM behaviors were significantly correlated with patients' age (p = .043) and patients' self-efficacy (p = .000). The analysis also reported that there was significant negative relationship between DSM behaviors and patients' level of educational (p = .008).

Discussion

Generally Diabetes Self-management (DSM) is the ability of diabetic patients to manage their daily life activities. These include adjustment of life styles, symptom management, medication, and the prevention of diabetic related complications. It is also includes: monitoring blood glucose levels; managing hyperglicemia or hypoglicemia; determining food types and amount eaten; following proper duration and frequency of exercise; adherence to medication doses and times; performing regular foot care; and early detection of the risk of complications.

In this study, patients generally reported that they performed good DSM. One of the factors that may affect this result is the setting this study conducted. Patients who attend in Out-Patients Department mostly showed good conditions that support them performed expected DSM. Another factor is patients' knowledge related to DM and its management (Huang, Zhao, Li, & Jiang, 2014; Kurnia, Amatayakul, & Karuncharernpanit, 2015; Sonsona, 2014). Furthermore, previous studies have noted that lack of knowledge related to the disease and its management was the main barrier to effective self-management behaviors (Bayliss, Ellis, & Steiner, 2007). In this study it was found that patients with knowledge scores higher than 8 reported higher/better DSM mean scores (M = 90.07) compared to those with lower knowledge scores (M =88.58). Another factor that may contribute to the results in this study is the patients' experience in receiving information related to DM and its management. As mentioned before, most of the patients reported that they received information about or attended some activities providing information about DM and its management. Patients who received such information showed higher knowledge mean scores (M = 7.55) and DSM mean scores (M = 89.61) compared to those who did not receive DM information (M = 7.33 and M = 86.11). However, these differences were not statistically significant. This was so between knowledge and DSM (p = .187) or the experience of receiving information and DSM (p = .330). It is of interest that patients' knowledge significantly correlated with self-

efficacy (r = .214; p = .038). These findings strengthen previous statement suggested that knowledge is necessary for behavioral change, but knowledge alone cannot lead to improve the self-care behaviors (Bandura, 1982; Knight, Dornan, & Bundy C, 2006).

Respondents in this study were mainly females and they showed better DSM (M = 90.21) than the males (M = 85.06). This result was different to previous findings that suggested that female patients reported lower DSM scores since they faced many barriers and time limitations because of their responsibilities as housewives (Whittemore, Melkus, & Grey, 2005). Moreover, female patients reported difficulties in scheduling their exercises and determining their own and their families' meals.

The patients' age also seemed to be one factors contributing to DSM. Patients' age and ones with a longer duration of diagnosed DM were more vulnerable to develop many of the complications either related to DM or the aging processes. The vision problems, cognitive impairment, musculoskeletal and joint problems that usually follow the aging process automatically reduced patients' ability to perform some activities related to DSM. A previous study reported that younger patients with a shorter duration of diagnosed DM performed better DSM, particularly in diet management (Mahfouz, & Awadalla, 2011). This study noted there was a significant (negative) correlation between patients' age and DSM (p = .043). This meant that patients with younger age showed better/ higher mean scores for DSM. However, this present study found different findings to the previous study where patients with a longer duration of being diagnosed DM reported better DSM (M = 90.68) compared with them with shorter one DM (M = 87.87). However, there was no significant correlation between the duration of being diagnosed (DM) and DSM (p = .273). This difference may cause by the way the researcher categorized the duration of being diagnosed DM, which is more/less than 5 years. In fact the DM-related complication mostly occurred in patients with longer durations of DM. In addition, this study only involved patients from an out-patients' department where the patients mostly enjoyed relatively good physical conditions without any serious complications.

The patients' levels of education were also considered as one of DSM contributing factors. A higher educational level gives broader opportunities to access information compared to those who had lower educational levels. In contrast, this study noted there was negative significant correlation between DSM and the level of educational (p = .008); this meant that patients with lower educational levels showed better DSM. This finding is supported by a previous study that suggested that patients with lower educational levels showed better DSM, especially in managing a diabetic diet (Mahfouz, & Awadalla, 2011). In the Indonesian context, a higher level of education commonly produces greater chances to enter better occupations. This automatically enhances their financial status and has a further impact on their dietary behaviors. With better finances they would have greater access to the many diets compared with those of a lower economic status. For diabetic patient, many choices of diets sometimes emerge as temptation that more difficult to be managed. Therefore, it is more challenging for richer patients to adhere to diet management.

The patients' self-efficacy is another factor that potentially contributes to better DSM. The level of self-efficacy describes the degree of confidence how patients show in performing the expected behaviors in DSM. In this study found the positive significant correlation between patients' DSM and self efficacy score, meant that patients with higher self-efficacy (higher confidence) reported better DSM behaviors. Previous studies have suggested that patients with higher self-efficacy (that is confidence) performed relatively better in DSM (Huang, Zhao, Li, & Jiang, 2014; Kurnia, Amatayakul, & Karuncharernpanit, 2015; Lanting, Joung, Vogel, Bootsma, Lamberts, & Mackenbach, 2008). Additionally, it also found that patients' self-efficacy score 34,8 + 3,98 was almost 75% compared to maximum score (48). This result strengthen the previous finding noted that patients' with self-efficacy score equal or more than 7 (0 -10) were more likely to performed the expected behaviors successfully (Bodenheimer, Davis & Holman, 2007).

Further analysis found there was a positive significant correlation between patients' self-

efficacy and patients' knowledge. It meant that patients who had better understanding regarding how to manage DM reported higher self-efficacy (confidence) to perform the expected behaviors. This fortify previous result reported that self efficacy was significantly correlated to knowledge (Taha, Zaton, & Elaziz, 2016). They also emphasize the important of education program in improving patients' knowledge and self efficacy.

With regards to this factor this current study showed a significant relationship between self-efficacy and patients' DSM (r = .483; p = .000). In addition, this study found that patients' self-efficacy level was significantly correlated with knowledge (r = .214; p = .038).

Conclusions

DSM is an important element in controlling diabetes related complications. This study identified the degree of DSM competence and its contributing factors. Most patients in this study reported high degrees of DSM competence. In addition, it also emerged that patients' age, level of education, and self-efficacy level were identified as factors contributing to DSM. Therefore, it nurses and other healthcare professionals should pay more attention to older diabetic patients, their educational levels and self-efficacy. However, it must be borne in mind that these findings may have a limited application as they involve patients in a one area only in Java.

Acknowledgements

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