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A concept analysis of Self-management among diabetes mellitus

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Abstract. The mortality and morbidity due to Diabetes Mellitus (DM) are increasing every year. Effectively in self-management has been demonstrated to conjunction patients with a health provider and support system to solve the patient's problem. Self-management in DM is very popular but still complex and abstract. Ambiguity regarding the intention of self-management in DM can cause confusion and misunderstanding among health professionals about the purpose and the application in the clinical situation. A perceptible definition regarding self-management for diabetes is required for clinical setting implication and future research. The study aimed **to** clarify and formalize the concept analysis of self-management in DM. We clarify the meaning of self-management in DM with concept analysis as outlined by Walker and Avant (2005). Attributes of self-management in diabetes were glycemic control process and activities, self-control, health-seeking, problem-solving, and decision making. Antecedents, consequences, and empirical referents are explained. Model, borderline, related, and contrary cases are explaining to clear and clarify the concept. Defining the concept can help the researcher solve the patient's problem about conjunction among patients with a health provider. Health professionals can advocate for antecedents in self-management and evolve interventions to support self-management attributes to serve patients in preventing complications.

Keyword: diabetes mellitus, concept analysis, self-management

INTRODUCTION

People with diabetes mellitus (DM) are increasing every year, not except in Indonesia. In 2017, Indonesia ranked sixth countries for the number of adults with diabetes (20-79 years), ranked fourth for undiagnosed diabetes globally, and ranked third as the deadliest disease (1,2). These events can occur due to problems of self-awareness related to economic factors (medical and accommodation costs) and the difficulty of processing health insurance. Access to health services, unsatisfactory health services, more trust with traditional medicine than modern medicine, and lack of knowledge regarding DM and risk of complication also reminded as factors (3). These conditions are aggravated by the fact that DM is one of the incurable diseases.

Furthermore, like incurable diseases, patients who suffer from DM unable to recover completely, patients will need lifestyle changes and consistent attention from care providers. Patients must be managed for life. Together, health care providers, patients, and support systems are tasked with managing the care, symptoms, and associated daily lifestyle modifications. Numerous health professionals supported self-management as an effective intervention to conjunction patients with a health provider and support system to solve the patient's problem (4,5).

Self-management is a dynamic, interactive, and daily process where individuals engage to manage their chronic illness. Self-management refers to an individual ability in conjunction with the community, family, and healthcare professionals, for managing their lifestyle, treatment, symptoms, psychosocial, cultural, and spiritual as consequences of health conditions (6). Optimal self-management requires one's ability to independently monitor the illness, develop and use cognitive strategies, behavioral and emotional, and maintain a satisfactory quality of life (7).

Understanding of the concept can be learned through the use of the term in other disciplines. Self-management in business was used to describe a person's ability to determine the strategies to develop their career. In management, each group of employees has autonomy in regulating personnel and work processes to achieve a common goal. In the discipline of information technology, self-management is intended to minimize human intervention to reduce mistakes and workload (8). In education, self-management is described as an attempt by students to control behavior that results in the disruption of others (9).

Self-management differs from compliance. Self-management refers to the dynamic process of maintaining health. Individuals are involved in attending to chronic diseases in chronic disease settings than compliance which is more focused on instruction. Self-management leads to a person's responsibility to care for himself continuously or for a lifetime due to chronic illness. Enhancing self-management can be done through emotional support, providing education, teach skills about how to manage themself in the regimen for changing the behavior. Actively involved in care, collaboration with health workers is a core component in self-management. Empowerment, setting the ultimate goal of therapy, and support are also essential aspects (10).

The previous study with the title "Chronic Illness Self-Management in prediabetes: a concept analysis" by Rothenberger (2011) was identified that self-management is closely related to self-monitoring, compliance, and adherence. Three of them almost the same, but it has no fundamental meaning associated with self-management (11). The concept analysis focuses on and clarifies the meaning of self-management on prediabetes to prevent diabetes

type 2. Research that focuses on self-management in diabetes, in general, has not been done and needs to be addressed.

Self-monitoring is intended for expressive behavior, how much people monitor their self-presentations, and affective displays as nonverbal. Therefore this concept is leading and related to self-management because self-monitoring in the health system is the ability of patients to plan care. Moreover, the patient is positioned as an active recipient in this context, not a passive recipient. The concept is significantly related to self-management.

On the other hand, the different concepts were related to self-management are adherence and compliance. As for meaning in the dictionary, adherence and compliance are closely related. a Person's needs always to follow a treatment plan that has been established with health workers is categorized into adherence (12). Then compliance pervades flexibility, accordance, and obedience in subsequent a determined care design. Several studies identify that compliance and adherence as concepts that may not link in patient-centered, as they lack autonomy and collaboration between individuals and health professionals. Therefore, adherence and compliance were components to make self-management working effectively (12).

Poor glycemic control was associated with poor adherence to medication use significantly among diabetic patients that attend the medical review at the diabetic clinic regularly. This indicates balancing all treatment methods, which include exercise, healthy eating, medication, and managing stressor emotions. The goal in diabetes management is to control a blood glucose level based on patient condition (3). Normally, blood glucose levels are below 80–120 mg/dL. The others, in healthy eating, patient need to be careful regarding the quality and quantity of the foods that his eat is contained nutritionally balanced. Regular physical activity and medication are one of the best things that patients can do to improve their health and control diabetes. Exercise offers all the goodness for patients with diabetes. Angry, scared, or depressed can affect blood sugar levels.

The others evidence which can support self-management in diabetes is support. Self-management support is expected to be more often delivered by family members and community organizations such as health providers or health workers in the hospital for stimulating patients. Some research on the role of social support and community organizations has been done, suggesting that network-centered approaches in the community may be particularly relevant for engaging people's health status (13).

However, self-management is very popular in the health care system, and it has been described, the concept of self-management in DM still complex and abstract. The results of a pilot study on self-management in a hospital show that each health professionals has his own opinion and understanding of self-management in patients with diabetes mellitus (3). Ambiguity regarding the meaning of self-management in DM can cause confusion and misunderstanding among health professionals about the purpose and the application in the clinical situation.

OBJECTIVE

This concept analysis aimed to clarify the theoretical definition of self-management in DM and explain the concept as an explanatory includes the antecedents, attributes, and consequences.

METHOD

Concept analysis was used to clarify the concept's meaning based on Walker and Avant (14). After the purpose of the study is determined, the search for literature-related concepts in databases such as PubMed, health literature, and Cochrane are carried out. Keywords used are self-, management or self-management, and concept analysis. Self-control, glycemic control, and health-seeking were searched in the literature. All articles were reviewed by team members independently, and selected articles were related to self-management for diabetes. The search focused on terms of diabetes and self-management used in 2010-2018. Synthesis of literature present to identify the attributes. The use of attributes can be seen in model, borderline, related, and contrary cases. Explanation of antecedents and consequences related self-management concept was proposed. The empirical referents considered further the theoretical and operational definition were stated. Explanation of concept can present a fundamental foundation for clarifying a theoretical definition of self-management in DM.

1) Identification Regarding Self-Management in DM

Self is the core of a person's basic reflection or self-drive to have the competence that reflects a person's need to continue to be competent at all times. Self-promoted an impersonation of a Greek compound firstly in the 16th century. After the 17th century, the self is not described in an individual definition in a dictionary (15). Furthermore, in self-promotive functions, the self-concept also provides and maintains a cognitive anchor, a consistent yardstick, or way of making sense of who one is and what to expect.

Oxford English Dictionary Online has defined management as a noun meaning 'supervision, organization, direction; applying skills or care to manipulate, care, use or control (16). The initial use of this word was started in the 16th century. In 1860, this word was used in medical context firstly that management can be defined as coordinating patient care to prevent the disease from achieving a goal (16).

DM is a group of metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion, action, or both. The chronic hyperglycemia of diabetes is associated with dysfunction, long-term damage, and failure of various organs, like the eyes, kidneys, nerves, heart, and blood vessels (1)**.**

Therefore, self-management in DM is the ability of patients to manage and control themself through the learning process that showed by internal and external action with glycemic control process and activities, problem-solving and health-seeking.

Determinant and Definition of Attribute

This literature provides basic ideas for this concept analysis. Based on these ideas, the authors reviewed other literature to identify and support the idea to reach antecedents, consequences, surrogate terms, and related concepts and context of application from more data collection and cited references.

No matter what kind or type of diabetes, there are three majors about self-management in DM that to keep in mind. Firstly is the glycemic control process and activities. The glycemic control process and activities can gain through adaptation and experience processes during illness. Secondly is self-control to detect early problems caused by diabetes. Thus, the third is health-seeking. Let's take a look one by one of the attributes regarding self-management in DM.

The first glycemic control process and activities maintain a blood glucose level that fits with the patient's condition. The range for normal blood glucose levels is below 80–120 mg/dL. The problems occur when the blood glucose level is too high, known as hyperglycemia, or too low, known as hypoglycemia. The patients' job as a self-manager in the glycemic control process and activities is to maintain his blood sugar is stable, not too high or too low. This is achieved by maintaining a balance through his exercise, eating plan, and using medicines if necessary. Moreover, strong emotions may also affect the stabilize of blood glucose levels; therefore, knowledge on managing these blood glucose levels can help control the diabetes of the patient effectively (4). Therefore, all definitions about glycemic control process and activities mean balancing all the treatment methods, including exercise, healthy eating, managing stress or emotions, and further medication.

For eating, the objective is to choose vegetables, fruits, and carbohydrates. Patients need to limit carbohydrate intake with simple sugars, such as cakes, candy, cookies, drinking sodas, or ice cream. Proteins are required in the absence of carbohydrates to repair muscle tissue, skin, and bones and supply energy for the body. Fats are used in the body for energy and help absorb vitamins. Watch the size of the portions of food which eating. It is better to eat smaller meals every 4–5 hours and make sure patients do not skip breakfast (17).

For exercise provides all the benefits for the person with diabetes that it does for everyone else. Stress and emotions such as anger, fear, frustration, and depression can also affect blood sugar levels. For this reason, it is essential to learn about ways to deal with these feelings effectively. Give information to patients that discomfort feeling is a normal part of life, patient need to deal with how to manage their condition, (5).

The second, self-control, is another attribute of self-management in DM. In self-control, a free person guides and directs his action. The individual can learn about how to use in directing and managing his own internal and external actions. If more individuals could develop practical self-management skills, the need for professional helpers and the number of passives, "you help me" patients might be sharply diminished (18). Self-control is a learning process to managing his external action by detecting early any problems caused by diabetes with any parameters (hyperglycemia or hypoglycemia sign and symptoms). Patients can show action to monitor, detection and funding the best solution to solve that problem. That's way, the third attribute in the self-management of patient DM included health-seeking, which has represents the utilization of information and skill necessary to adopt DM condition. Health-seeking behavior is prefaced by a decision-making process that is further governed by individuals and/or household behavior, community norms, and expectations, as well as provider-related characteristics and behavior.

Moreover, health-seeking behavior has been defined as any action by individuals who perceive themselves to have a health problem or be ill to find an appropriate improvement. From the health-seeking process, the patient will represent the application of information, a skill necessary and knowledge to adapt in a chronic illness state and can be obtained through personal experience and the development of expertise by the system around patients as external aspects get confidence during suffering DM. Knowing the appropriate remedy from health seeking can make the patient understand the cause and symptoms before actively participating in their care. As a result, practice how to find problem-solving and decision-

making from self-monitoring as others attributes are successful (15). In the health-seeking process, the patient will get the ability to find the best solution for themself.

2) Identification Antecedent and Consequence

Antecedent

The need for information about DM is crucial. Its impact on what kind of information that patient needs during illness. Information has a strong correlation with knowledge. Good information will increase the understanding of the patient (19). Treatment option was a fundamental precursor in self-management. Basic information should be provided in a conducive format to learning and tailored specifically based on the person's needs (15).

Self-management social support intervention was improved on behavioral and physiologic outcomes. The improvement on behavioral outcomes related to self-care activities, distress with the regimen, sedentary behaviors, and diabetes knowledge. The most significant effect was on decreasing distress which was associated with managing the diabetes regimen. This result is supported by other studies where mention that social support interventions were related to psychological distress improvements. The good outcomes among participants may have benefited from the social support (20). Family and health professionals' support is one of the critical attributes of the concept. Interaction and feedback from a healthcare provider and family continuously can help the patient develop their problem-solving skill and make the patient have confidence and comfort during suffering DM illness. The health care system needs to provide support and education about diabetes by a multidisciplinary team. Poor quality services have been indicated as an obstacle to the prevention of DM at the individual and community level (15). Assurance was included in the health care system, which able to support self-management to be successful.

Knowledge

Reporting of knowledge about the function of therapy, process of disease, and treatment plan were necessary for their ability to succeed in self-management. The way how to apply self-management knowledge to their lives is the most important an individual needed. If patient did not know how to manage and why they have to manage the illness, their efforts were precluded.

Psychological

Distress in psychological affects self-management and plays multiple roles (21) and anxiety, heart problems, and fear (22). On the other hand, anxiety can make someone more careful about the disease.

Support

A study reported that support from partners or peers was influential on diabetes self-management. Family, friends, especially those who are nearby, helped with various aspects of diabetes self-management. The helping includes healthy food preparation, medication reminder, and medical appointments (22–24).

Financial/health insurance

Access to health care, continuity of care, interaction with health professionals, and the ability to access health care facilities are tasks on a health system that influencing individuals believe in success in self-management.,

Studies reported that lack of access to health professionals such as specialists and nurses are influenced accessibility to resources on education. Radio, books, or brochures that provide DM information was identified as a facilitator (25).

Financial and insurance problems become obstacles in self-management. People with low incomes will be more inclined to think about its economic survival compared to its illness. The high price of drugs, healthy foods to choose from, and the availability of quality services are the limitation. Loss of work will further aggravate the condition so that good health insurance will help someone to remain able to access health care for themselves.

Spiritual and culture

Studies reported that spiritual beliefs affected accepting the resultant change in life for patients with DM as a chronic illness. Spiritual activities such as prayer have a significant contribution to one's belief in conducting self-management as well. Spiritually enhances positive thoughts in a person. Cultural beliefs and traditions primarily were identified as congruence on self-management (3).

Communication

Good communication is an essential part of making self-management to be a success. Good communication using language that is easy to understand to a patient can support them in completing every goal they want to achieve. Health workers need to pay attention to these aspects to prevent misperceptions between patients and health workers. The easy way in terms and information was adequate in the understanding of information (4).

Clinical

The severity of illness, side effects of treatment, and decreased cognitive function affect one's self-management. Physical limitations due to illness make the regimen more complex. It was contributed to symptoms that bothered on effort in diabetes self-management (26).

Self-efficacy

Own perception of his or her ability to perform an act is known as self-efficacy. Motivation, ability, desire, resources, and environment are aspects incorporated and influence patients' decisions about their actions. An individual's confidentiality inabilities to perform health behaviors will influence patient performance and adherence. Therefore, a belief in one's ability to successfully perform health behaviors directly impacts self-management behaviors (4,18,24).

Consequence

The consequences of self-management in DM almost the same as the consequences in chronic illness in general. In DM self-management, consequence congregated into three major themes: (1) change behavior, (2) self-efficacy, and (3)improved clinical outcomes (15).

Improved clinical outcomes are one of the stand-out methods for evaluating the success of self-management programs in chronic illnesses like diabetes in the literature. Hemoglobin A1C levels, Blood glucose, fatigue, complications, body mass index, LDL-C, HDL, LDL, blood pressure are clinical outcomes evaluated in self-management.

Relevant study results in Taiwan showed that self-management and self-efficacy have a positive correlation. self-efficacy and self-management increased, then the quality of life was preserved, and patient behavior was improved. Therefore, self-efficacy includes a consequence of self-management.

The other study in the literature was measured that the success of self-management programs is the change behaviors. The behavior showed by visit and contract with a health provider, monitor their blood sugar by themself, suitable self-care activities, and cooperative with health care. From changing behavior, hospitalizations, service utilization, emergency room visits, complication rates will decrease and effecting reducing healthcare costs (15).

The consequences of maintaining independence, health, happier patients, freedom, well-being, and viewing coping strategies as effective were collapsed into the summary category of quality of life improvement (15). Better physical and psychosocial well-being during suffers DM are implied on quality of life for patients with DM.

Model Concept Analysis

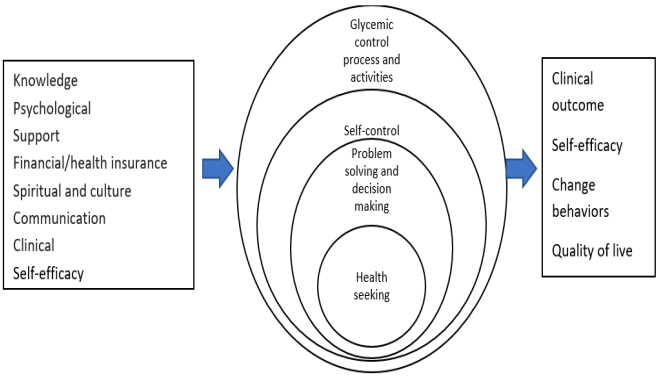

Figure 1. Model concept analysis of self-management for DM

3) Operational Definition Self-Management in DM

Self-management in DM is the ability of patients to manage and control themself through a learning process that showed by internal and external action with glycemic control process and activities, problem-solving and health-seeking. Glycemic control process and activities through try to limit carbohydrates with simple sugars, choose low-fat or nonfat foods often, watch the portions of food. With smaller portions, be sure not to skip breakfast, then meals with more miniature food every 4–5 hours are essential for diabetes self-management. In addition, exercise such as walking, cycling or swimming with a duration of 30 minutes four times a week becomes the primary goal., but preferably every day. The best time to exercise is when the blood sugar in the highest level or 1-2 hours after the meal. In addition, emotional control through learning effective ways to deal with these feelings. Self-control by detecting early any problems caused by diabetes with any parameters (hyperglycemia or hypoglycemia sign and symptoms) such as check hemoglobin A1C and blood glucose levels as personal and health care seeking by actively participate in their care.

4) Case Studies

Model Cases

Mr. W, 48 years old, was taken by his family to the hospital because he complained of weakness and decreased consciousness. During the examination and assessment, his family

said that Mr. W often urinates a lot at night, eating. Still, it is challenging to complete and easy to drowsy during activities. It was found that Mr. W had a family history of DM. The results of the examination, HbA1c Mr. W was 8%. The nurse said that Mr. W was suffering from DM type 2 but no need to be treated in hospital. Recommendation, Mr. W is encouraged to control eating, exercise regularly, and take blood-sugar-lowering drugs regularly.

While at home, Mr. W undergoes all activities recommended by a nurse and medical advice. Patients now often control their blood sugar in the polyclinic each month and routinely source information about diabetes through health magazines and discussions with nurses around their homes. Sometimes Mr. W feels weakness after exercise, but a patient immediately resolves it by drink sweet tea and eating some cake. After three months, Mr. W checked HbA1c in the clinic, and It was found that his HbA1c value was 6.6%.

The case accommodates all the attributes of the concept. Appropriate individualized achievement is set in this case. Mr. W engages in the glycemic control process and activities and health-seeking by controlling eating, regular exercise every day, taking drugs regularly at home, and actively sources information in a health magazine, and discussing with health workers around their home. Mr. W engages in self-control by control blood sugar and resolves checked HbA1c in the clinic. Moreover, he participates in problem-solving and decision-making by sweet drink tea and eating some cake after-feel weakness during exercise.

Borderline Cases

Mr. W, 48 years old, was taken by his family to the hospital because he complained of weakness and decreased consciousness. During the examination and assessment, his family said that Mr. W often urinates a lot at night, eating. Still, it is difficult to full and easy to drowsy during activities. It was found that Mr. W had a family history of DM. The results of the examination, HbA1c Mr. W was 8%. The nurse said that Mr. W was suffering from DM type 2 but no need to be treated in hospital. Recommendation, Mr. W is encouraged to control eating, exercise regularly, and take blood-sugar-lowering drugs regularly.

While at home, Mr. W undergoes all activities recommended by the nurse and medical advice. Patients now often routinely source information about diabetes through health magazines and discussions with nurses around their homes. Sometimes Mr. W feels weakness after exercise, but a patient immediately resolves it by drink sweet tea and eating some cake.

The borderline case does not contain all the attributes of the concept. He follows nurse and medical instructions for glycemic control process and activities by controlling eating, regular exercise every day, and taking drugs regularly. Moreover, he engages in problem-solving and decision-making by drinking drink tea and eating some cake after-feel weakness during exercise and knowledge resources by routinely source information about diabetes through health magazines and discussion with nurses around his homes but without the health-seeking control blood sugar and resolves checked HbA1c.

Related Cases

A related cases use the concept that is similar but different from self-management (14). This case leads to adherence rather than self-management.

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the examination, HbA1c Mr. W was 8%. The nurse said that Mr. W was suffering from DM type 2 but no need to be treated in hospital. Recommendation, Mr. W is encouraged to control eating, regular exercise every day, and take blood-sugar-lowering drugs as regularly as well as control again to the hospital after one month.

While at home, Mr. W is recommended by a nurse and medical advice for drinking drugs regularly. After one month, the patient controls his blood glucose, and the result is 110 mg/dl. On the other hand, Mr. W stops taking drugs and doing activities like before being diagnosed with DM because he feels full recovery.

In case Mr. W successfully decreases her blood glucose level, her activity more leads to adherence rather than self-management. He just attends to physician instructions by drink drugs regularly. He does not continue his glycemic control or demonstrated self-management attributes of self-monitoring, problem-solving, and proper decision-making and knowledge resources.

Contrary Cases

Contrary cases were not clarifying of attributes (14).

Mr. W, 48 years old, was taken by his family to the hospital because he complained of weakness and decreased consciousness. During the examination and assessment, his family said that Mr. W often urinates a lot at night, eating. Still, it is difficult to full and easy to drowsy during activities. It was found that Mr. W had a family history of DM. The results of the examination, HbA1c Mr. W was 8%. The nurse said that Mr. W was suffering from DM type 2 but no need to be treated in hospital. Recommendation, Mr. W is encouraged to control eating, exercise regularly, and take blood-sugar-lowering drugs regularly.

While at home, Mr. W denial to control eating, regular exercise every day. Sometimes he only drinks drugs unregularly but caused by the pressure of the family. Patients said that he did not believe he suffers from DM and doesn't want to follow all medical instructions.

Mr. W was decided not too involved in the set goal of the glycemic control process and activities. She refused to do a collaborate with health care providers and family. Mr. W is not engaged in self-management.

5) Empirical References

Measurement of the concept is involving by using empirical referents (14). Patient personalized goals can measure goal setting through a client's self-report. The essence of the successful application of the concept can be seen from the presence of the patient's ability to process glycemic control accurately by control diet, exercise, and drink medication as regularly for the long term and be a habit in their life. We can assess it with the tool. Engagement in self-control can be measured by patient behavior. This information would be based on the patient's preferences, personalized goals, and a physical outcome like blood glucose and HbA1c. Problem-solving and decision making can be measured by evaluating patient experience when their feel sign of hypoglycemia or hyperglycemia. Moreover, their health-seeking can be measure by evaluating patient knowledge about DM in general. Consequences of self-management can be measured by laboratory results, physical examination, changing of behavior and tool in self-efficacy, and the quality of life.

CONCLUSION

Tentatively definitions, antecedents, attributes, and consequences of diabetes self-management have been discovered. Ongoing analysis and future study are required as the concept evolves. The clarity of the concept meaning potential to increase the productivity of further research. Descriptions of current concepts can provide an essential foundation for clarifying the theoretical definition of self-management in DM.

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