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Research Article

Calgary Family Intervention Model Approach to Improve Quality of Life for Diabetes Mellitus Patients

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Abstract.
Calgary Family Intervention Model (CFIM) is a nursing care model that is dominated by the family and integrated with the nursing paradigm that focuses on families. A case study was conducted to determine the intervention to improve the quality of life for the patient with diabetes mellitus. Nursing care was carried out using the Calgary Family Intervention Model approach with the author for three days and continued by the family for two weeks. With data collection techniques include interviews, observation, physical examination, and documentation. The tools used in this case study are a set of physical examination tools, blood sugar check tools, a nursing kit, and the WHOQOL-BREF questionnaire. The results showed that Mr. J's family had problems in the dimensions of physical and psychological health, with the established nursing diagnosis being a poor quality of life. In family members who experience diabetes mellitus with quality of life problems there are positive changes to the family and in handling, nutrition, exercise, foot care, and stress management for the patient. It can be seen from the results questionnaire which showed an improvement in scores than before, especially in the dimensions of physical and psychological health.

Keywords: Calgary, diabetes mellitus, family, nursing, quality of life

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1. Introduction

Diabetes mellitus (DM) is a metabolic disorders with multiple etiologies characterized by blood sugar levels exceeding normal limits between 70-110 mg/dl [1], [2]. This metabolic disorder is often associated with impaired carbohydrate, fat, and protein metabolism as a result of insulin deficiency. Insulin function can be caused by impaired or insufficient insulin production by the beta cells of Langerhans of the pancreas, or by the body's cells not responding to insulin [3].

The World Health Organization (WHO) argues that DM is the main cause of death globally and about 1.5 million deaths in 2019 in the world and in 2014 there were 422

million adults suffering from diabetes [4]. The International Diabetes Federation (IDF) predicts the number of people with DM in the population aged 20-79 years in several countries in the world, identifying 10 countries with the highest number of cases. China, India and the United States ranked in the top three, with 116.4 million, 77 million and 31 million cases [5]. Indonesia ranks 7^{th} out of 10 countries with the highest number of cases or 10.7 million. The description of DM prevalence by province in 2019 shows that West Java has a prevalence of 1.7%, with the prevalence of DM in women (1.7%) higher than men (1.21%) [6]. The number of DM cases in Ciamis Regency in 2018 was 7,431 cases, and increased in 2019 to 23,857 cases.

The high prevalence of DM is caused by the mentality of the community that ignores various things related to health problems [7]. As a result, the quality of life in various dimensions has decreased significantly. There are four dimensions that are used as indicators in measuring the quality of life, namely physical health, psychology, social relationships, and the individual's environment such as the family unit [8]. Therefore, nursing care with a family approach needs to be carried out in a comprehensive system and subsystem such as the Calgary Family Intervention Model (CFIM) [9].

The CFIM approach is an organized framework for identifying the relationships between families and caregivers that help change and initiate healing [10]. CFIM provides specific strategies that caregivers can use to promote, enhance, and maintain effective family functioning [9]. The best intervention strategy designed to help families empower themselves with intervention models based on careful clinical practice observations. CFIM combines theories from general systems, cybernetics, communication, and theory of change. This theory is combined with a nursing paradigm or nursing perspective that focuses on families who have health problems [11].

CFIM is an appropriate intervention in changing the affective, cognitive, and behavioral domains of family functional problems, including those experienced by family members [12]. The primary objective is to identify the relationships between family and caregivers that help change and initiate healing by focusing on the confluence of family member functions and nurse-provided interventions. CFIM focuses on enhancing, improving, and maintaining effective family functioning in three domains: cognitive (thinking), affective (emotional), and behavioral (action) [9].

The purpose of this case study is to carry out comprehensive family nursing care including comprehensive assessments, establishing diagnoses, planning, implementing actions, evaluating, and documenting the results of family nursing care actions using the CFIM approach to improve the quality of life of DM patients.

2. Method

The case study design was carried out by nursing care approach with the main objectives to explore the problem, provide an overview of a case, analyze more deeply about nursing care with the CFIM approach, and measure the quality of life scores of DM patients before and after the intervention. Post Test is done after two weeks of applying the CFIM approach by the client's family (6-18 June 2022).

The subjects in this case study are families who meet the inclusion criteria, including family members who have DM, family type is Nuclear Family, able to communicate verbally and interact cooperatively, able to read/write and willing to be a subject by filling out informed consent. Nursing care is carried out for three weeks starting with preparation to case study reports. Data was collected by interview, observation, physical examination and documentation.

The instruments used in this case study are a set of physical examination tools, blood sugar checking tools, nursing kits, and questionnaires. The questionnaire used is the WHOQOL-BREF quality of life instrument which has four dimensions including physical health, psychological, social relations, and environmental dimensions. All questions are based on a 5-point (1-5) Likert scale that focuses on intensity, capacity, frequency, and rating. Response intensity scale refers to the extent to which a condition or situation is experienced by a person. The response capacity scale relates to the ability to perceive, situations, or behaviors. The frequency response scale refers to the number, frequency, or speed of a situation or action. Rating scales refer to situational, performance, or behavioral assessments. The data is presented in the form of tables, graphs and descriptive narratives.

3. Result and Finding

3.1. Nursing Assessment

The client named Mr. J, 54 years old from Mandalika, Cikoneng with Diabetes Mellitus (DM). The composition of the patient's family consists of his wife and children. Mrs. A is 37 years old as a wife and R is 10 years old as a child of Mr. J and Mrs. A.

Mr.J's family type is The Nuclear Family type with a stage 4 family development (family with school children). Mr.J's family comes from the Sundanese (Indonesian) tribe with a culture that does not conflict with health problems. Mr. J as the head of the family has a history of Diabetes Mellitus (DM) since 20 years ago, has a history of hypertension

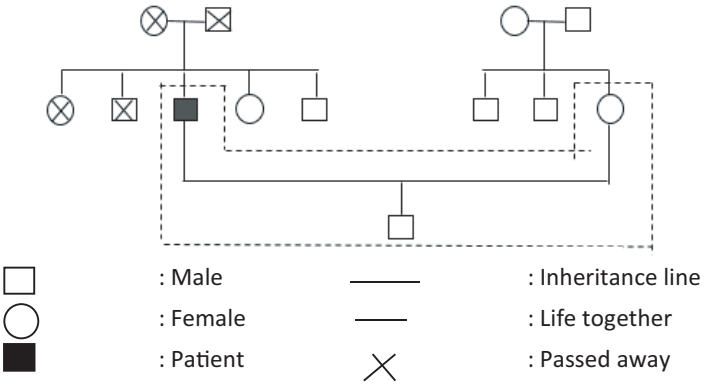

Figure 1: Family pedigree.

since 5 years ago, has suffered from pulmonary TB and has completed his treatment completely, and 1 month ago he had dengue fever and had to be hospitalized. Cikoneng Health Center. Mrs. A has never been treated or has a history of hereditary diseases. while An.R had a history of febrile seizures when he was 3 years old, and had to be hospitalized. Based on the information obtained from Mr. J and Mrs. A that in the previous family there was no history of hereditary diabetes mellitus (DM).

At the time of the assessment, the results of the quality of life of Mr. J on the physical health dimension with a score of 50 (enough), the psychological dimension of 31 (enough), the social dimension with the largest score of 69 (good) and the environmental dimension with a score of 56 (good). Mr.J said that his general health in his quality of life was mediocre quality of life and Mr.J was not satisfied with his health. When the physical examination was carried out on Mr. J, the results showed that the general condition of the client was good, blood pressure 190/100 mmHg, breathing 20x/minute, pulse 82x/minute, temperature 36.2°C, SpO2 98%, and blood sugar at 242 mg/dl. The condition of the skin on Mr. J's feet is dry and Mr. J's feet are stiff and there are no abnormalities in other physical examinations. Mr.J said he did not feel weak, dizzy, and did not feel other symptoms that should be felt by someone with DM. The client said that when his blood sugar was less than 200 mg/dl, he felt weak and dizzy and interfered with the activities of Mr. J. and when blood pressure is less than 190/100 mmHg, you feel dizzy.

On Mrs. A, the results of the physical examination were in good general condition, blood pressure 110/mmHg, temperature 26°C, pulse 86x/minute, respiration 18x/minute, SpO2 98% and on other physical examinations there were no problems. In An.R the results were 36.5°C temperature, 90x/minute pulse, 22x/minute respiration, 98% SpO2 and on other physical examinations there were no problems.

3.2. Problem Analysis

Table 1: Problem analysis.

Data Analysis	Ethiology	Problem
Subjectives: The patient said the quality of life was mediocre and was dissatisfied with his health. **Objectives**: Physical health domain score 50 (adequate), psychological 31 (adequate), dry leg skin and stiff feet, and vital sign (blood glucose 242 mg/dl, sphygmomanometer 190/100 mmHg, respiration rate 20 times/minutes, pulse 82 times/minutes, temperature 36.2˚C, and oxygen saturation 89%).	DM ↓ Lack of information ↓ Lack of knowledge and anxiety ↓ Low of QoL	Severe of QoL

3.3. Nursing Care

Nursing interventions and activities need to be established for the improvement, improvement, and maintenance of effective family functions on the client's quality of life with the CFIM approach. In the CFIM approach, the activities carried out include planning to identify family involvement in care, assessing family knowledge about DM, explaining and demonstrating to families in caring for family members with DM (DM treatment, nutrition, exercise, foot care), and planning stress management.

3.4. Nursing Outcome

During the intervention of three meetings, there were positive changes to the family and clients in management, nutrition, sports activities, foot care, and stress management for clients [13]. Likewise, after the CFIM approach was carried out for two weeks, the results of filling out the WHOQOL-BREF questionnaire showed that Mr. J's quality of life on the physical health dimension was in a good range, the psychological dimension was good, the social relations dimension was good, and the environmental dimension was in a good range. Clearly, the change in the patient's quality of life (QoL) score can be seen in Figure 2.

4. Discussion

After family nursing on Mr. J with DM, the author describes the gap between the theoretical review and the existing case. To facilitate the discussion, the authors use a family care

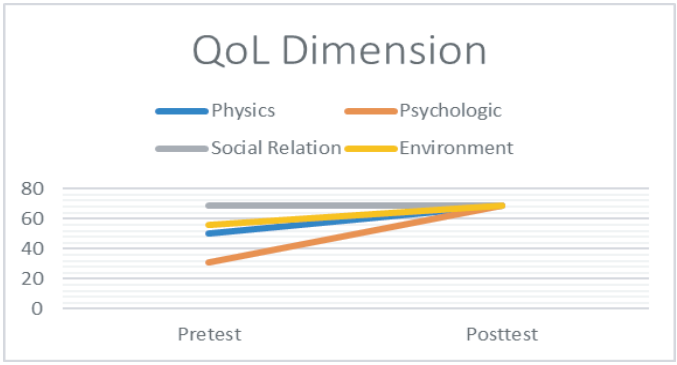

Figure 2: Skor change of QoL.

process approach that begins with the process of assessment, diagnosis, intervention, implementation, and assessment of family care. pAccording to the results of the study conducted on Mr.J's family, that Mr.J suffers from DM. When the physical examination was carried out on Mr. J, the results showed that the general condition of the client was good, blood pressure 190/100 mmHg, breathing 20x/minute, pulse 82x/minute, temperature 36.2°C, SpO2 98%, and blood sugar at 242 mg/dl. The condition of the skin on Mr. J's feet is dry, the condition of the feet is not clean and there are no abnormalities in other physical examinations. There are no symptoms experienced by Mr. J that should be felt by someone with DM.

In accordance with the clinical symptoms or complaints stated in the theory, there are gaps, namely in cases where there are no acute or chronic symptoms. Meanwhile, according to the previous theory that the clinical manifestations of DM are divided into two, namely acute symptoms and chronic symptoms [14]. Acute symptoms include polyphagia, polydipsia, polyuria, chronic symptoms: tingling, hot or stinging skin, numbness of the skin, cramps, malaise, Drowsiness, blurred eyes, loose teeth, in men it can cause poor sexual performance or even helplessness [15]. This can happen because the client repeatedly experiences hyperglycemia. This repetition can cause adverse effects in the body. The body should be able to respond or give a signal to the body, so that no symptoms arise. This condition can be dangerous because there can be delays in treatment and late handling which can cause blood sugar levels to continue to rise and eventually experience severe hyperglycemia [16].

Mr.J's quality of life shows a poor quality of life in the dimensions of physical and psychological health, as well as Mr.J's general health with a mediocre quality of life and feels dissatisfied with his health. This is in line with research which showed that the quality of life of clients with DM decreased in the dimensions of physical health, psychological and role disorders due to physical problems [17]. The poor quality of

life in Mr. J is influenced by the length of time Mr. J has suffered from DM and blood sugar levels that are not well controlled which can lead to physical complaints. Previous research showed that the longer patients suffer from DM, the lower your quality of life. The more complications from DM disease greatly affect the quality of life of DM patients [18].

The results of filling out the WHOQOL-BREF questionnaire obtained results on the physical health dimension with a score of 50 (enough), the psychological dimension of 31 (enough), the social dimension with the largest score of 69 (good) and the environmental dimension with a score of 56 (good). It can be concluded that the quality of life is not good. To overcome this problem, the author uses a Calgary family intervention model approach that involves the family in the process of improving, repairing, and maintaining effective family functions on the client's quality of life and focusing on the meeting between the functions of family members and the intervention provided by the author.

In the CFIM approach, the authors plan to identify families for involvement in care, assess family knowledge about DM, explain and demonstrate to families in caring for family members with DM (DM treatment, nutrition, exercise, foot care), and plans for stress management [19]. Therefore the authors carry out nursing care in accordance with the plan. Starting from reviewing family knowledge about DM to planning for the care of family members with DM by the family at home. The family is open and accepting of the author's actions and statements, so that all plans can be carried out.

During the three-meeting CFIM approach, there were positive changes to the family and clients in handling, nutrition, exercise, foot care, and stress management for clients. Likewise, after the CFIM approach was carried out for two weeks, the results of filling out the WHOQOL-BREF questionnaire showed that Mr. J's quality of life on the dimensions of physical health was in good range, psychological dimensions were good, dimensions of social relations were good, and environmental dimensions were in a good range. This is in line with previous research that in the intervention group there was an improvement in the quality of life of patients with type 2 diabetes after being given the CFIM approach [9]. While in the control group there was no improvement in quality of life because the CFIM approach was not given. With the value of the results of data analysis using the Wilcoxon test in the intervention group, the p value is 0.000, and the p value is 0.111 in the control group.

5. Conclusion

Quality of life in clients with DM has increased in the dimensions of physical health and social dimensions than before. And during the intervention three meetings with the author and for two weeks with the family there were positive changes to the family and clients in handling, nutrition, exercise, foot care, stress management for clients. Respondents are expected to monitor their blood sugar levels regularly, take medication correctly and regularly according to doctor's recommendations, and exercise and eat foods that can lower their blood sugar levels.

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