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Original Research

Study of Diabetes Mellitus Management Policies Using a Systems Approach in Surge Capacity

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ABSTRACT

Background: *The prevalence of Diabetes Mellitus (DM) in Indonesia continues to increase, even though DM control policies and programs have been implemented. According to existing policies, the family has not been involved in diabetes control. This study evaluates diabetes mellitus management policies by designing family-based community empowerment model interventions with a systems approach to surge capacity.*

Methods: *The design of this study used a cross-sectional operational analysis conducted in Cirebon City with 26 participants. Data collection was carried out using Focus Group Discussion (FGD) and in-depth interviews using interview guidelines from the surge capacity component. Inclusion criteria were Non-Communicable Diseases program holders at the Cirebon City Health Office and Community Health Centers with the highest and lowest prevalence, and DM sufferers and their families representing each age and gender category. Data analysis was performed using open code.*

Results: *The non-communicable disease program has not been integrated between the health office and the hospital; funds for the DM prevention program have not met the needs; there are limited human resources with multiple tasks and an excessive workload, so it is not optimal for DM health services; and there is a lack of family involvement in diabetes control, so the incidence of DM is still not usually controlled.*

Conclusion: *Policy studies using a system approach in surge capacity have been able to dig up various information on DM control efforts in terms of policy, organizational structure, DM surveillance, information systems, integrated services, case screening, budgeting, and community empowerment.*

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INTRODUCTION

Diabetes Mellitus (DM) is a Non-Communicable Disease that is an issue of the 2030 Sustainable Development Goals and is a priority in every country (Direktorat Jenderal Pencegahan dan Pengendalian Penyakit, 2019). The International Diabetes Federation estimates that the prevalence of DM worldwide is 9.3%. Indonesia is the only country in Southeast Asia that is included in the ten countries with the highest DM sufferers in the world (Kementerian Kesehatan RI, 2020).

Diabetes Mellitus can cause heart disease, kidney failure, blindness, and even death, especially during the COVID-19 pandemic, which is still happening today. Diabetes Mellitus is the second-largest comorbid disease that increases the risk of death in Indonesia (Kemenkes, RI, 2020). The prevalence of DM in Indonesia based on a doctor's diagnosis at the age of >= 15 years has increased from 1.5% in 2013 to 2% in 2018, as well as the prevalence based on blood sugar examination results from 6.9% in 2013 to 8.5% in 2018 (Badan Penelitian dan Pengembangan Kesehatan Kemenkes RI, 2019a).

This prevalence is still very far from the global target of the P2PTM program. Namely, there is no increase in DM or 0% (Direktorat Jenderal Pencegahan dan Pengendalian Penyakit, 2019). The difference in the prevalence of DM based on a doctor's diagnosis and blood sugar examination shows that only 25% of sufferers know they have DM (Kementerian Kesehatan RI, 2020). West Java Province has a high DM prevalence of 1.7% (Badan Penelitian dan Pengembangan Kesehatan Kemenkes RI, 2019a). Cirebon City is a city in West Java Province with the highest DM prevalence of 3.58%, which exceeds the national prevalence (Badan Penelitian dan Pengembangan Kesehatan Kemenkes RI, 2019b).

The government has issued a policy through Permenkes, or Regulation of the Minister of Health number 71 of 2015, concerning the management of Non-Communicable Diseases (NCDs) (Kemenkes, 2015). Permenkes explains that the central government, local government, and the community are responsible for managing NCDs and the consequences they cause through community health efforts and individual health efforts. Prevention of NCDs through Public Health Efforts is carried out with prevention and control efforts focused on controlling modifiable risk factors through health promotion activities, early detection of risk factors, and special protection. Control is carried out through early-case findings and early management activities. Handling individual health efforts is carried out by handling cases.

Health promotion aims to realize clean and healthy behavior by practicing CERDIK behavior, namely periodic health checks, getting rid of cigarette smoke, diligent physical activity, a healthy diet, balanced nutrition, adequate rest, and managing stress, carried out by health workers who are competent in the field and empower health cadres (Kemenkes, 2015). Even though there has been a policy on DM prevention until now, it has not shown any significant success, as evidenced by the increasing prevalence and low CERDIK behavior for diabetes prevention. In Cirebon City, the proportion of people eating sweets > once a day was 56.99%, and the habit of drinking sweets was 70.36%. The habit of consuming fatty foods once per day was 58.77%, and physical activity that was less active was 43.89%. All these figures exceed national figures.

In existing policies, the family has not been involved in diabetes control. The results of previous research concluded that the Sundanese culture-sensitive family empowerment model was effective in increasing family behavior and greatly

contributing to DM control (Badriah & Junaiti Sahar, 2017; Badriah et al., 2019; Badriah et al., 2021). The purpose of this study is to examine diabetes mellitus management policies using a systems approach to surge capacity.

MATERIALS AND METHOD

The study conducted is a cross-sectional operational analysis and policy research. This study explores the implementation of current regulations and what potential can support them so they can be implemented properly following existing regulations. The participants of this study were the head of nursing at Gunung Jati Hospital, Cirebon City; non-communicable disease officers, doctors, and nurses from Puskesmas Perumnas Utara and Puskesmas Kalitanjung, Cirebon City; Head of the Cirebon City Health Office; Head of Disease Prevention and Control; and Coordinator of Non-Communicable Diseases. The number of participants was calculated by a purposive sampling technique, with as many as 12 participants.

Data were collected from November 12 to November 15, 2022, through in-depth interviews and focus group discussions, using digital sound recordings and field notes, with each participant in their home in approximately 60 to 90 min/sessions, for a total of 4 interview sessions for one participant from the head of the nursing field at Gunung Jati Hospital. Focus Group Discussion data collection techniques have been carried out with health workers from the Puskesmas Perumnas Utara Puskesmas Kalitanjung and the Cirebon Health Office regarding efforts to control DM using the system approach in the surge capacity. The FGD activities were carried out on September 13, 2022. Data analysis in this study used qualitative analysis, namely content analysis, a scientific research technique aimed at describing the characteristics of the content and drawing inferences from the content. Content analysis was carried out using open-source software.

This research has passed the ethics test from the Gunung Jati Hospital, Cirebon ethics committee, with the number 044/LAYAKETIK/KEPPK RSGJ/IX/2022. In carrying out this research, it has fulfilled ethical principles such as explaining the research objectives, maintaining the confidentiality of respondents, and providing sufficient time for data collection. In addition, this study provides direct benefits, namely optimizing the implementation of Regulation of the Minister of Health number 71 of 2015 concerning the management of Non-Communicable Diseases (NCDs), specifically in the prevention and control of DM.

RESULTS

Characteristics of participants

There were twelve participants (two male and ten female), with an age range of 32 to 55 years. Their educational level varies; one participant passed the master of health, and eleven passed the bachelor's in nursing and public health. The length of work varies from 5 years to 10 years.

Management of DM in a Cirebon City-based system in the Surge Capacity System

The system in DM management includes policies and regulations, organization, structure, DM disease surveillance, information system, budget, case screening, integrated health services delivery, and community empowerment, as clearly described as follows.

Policies/Regulation

System analysis (integrated policy and management) in managing DM in the city of Cirebon. Based on the results of interviews with research informants, information was obtained regarding policies and management in DM in the city of Cirebon that the regulations and policies are divided into, namely, regulations that apply to the national level, such as Minister of Health Regulation No. 71 of 2015 concerning NCDs, PMK No. 5 of 2017 concerning the 2015-2019 National Action Plan for the Management of NCDs, and Minister of Health Regulation No. 4 of 2019 concerning the Minimum Service Standards and NCDs management manual. The Regulation at the City District Level, which is the guideline, consists of Regional Regulations on the Prevention and Management of NCDs, the Mayor's Circular on Prevention and Control of NCDs, the Mayor Decree, and standard operating procedures related to Minimum Service Standards No. 43 of 2016. The implementation of policies that apply in hospitals using Minister of Health regulations clinical guidelines no. HK 107, as stated by the informant, "..that the policies in force in cities and provinces are following national policies, achievement of the Minimum Service Standard target must be 100%, and the policy is made not specifically for the treatment of DM but for NCDs."

Organizational Structure

According to the information of the participants at the city or health office level, "the organizational structure of DM control shows that the structure of the service is integrated into NCDs. The structure looks "big" because many disease programs are integrated over there. The participant from the hospital stated that "the structure of DM treatment does not stand alone but is part of internal medicine." The Community Health Center (Puskesmas) received information from the participant: "The structure is integrated with NCDs; Posbindu and cadres are not included in the structure."

DM Disease Surveillance

The participants' answers to DM surveillance were divided into two categories, namely: a) regarding the objectives and implementers of the surveillance that surveillance aims to find or screen new sufferers; for old sufferers, it is more about treatment management. b) the timing of the surveillance as described below: "..surveillance of DM is not carried out separately but together in an NCDs program, by circulars and guidelines. Surveillance is carried out once a year, both outside the building and inside the building. Cadres assist in implementation at Posbindu and Posyandu with the target population aged 15 years and over. If suspected DM is found, they will be referred to the puskesmas, and a repeat test will be carried out at the puskesmas."

Information System

The participants answered that the information system in management DM was divided into two categories, namely types of information systems and constraints on the implementation of the information system.

The type of information stated by the participant is as follows: The Health Service and Puskesmas already have "SI PTM, or Information System NCDs," but this year a new IS, namely "ASIK," has appeared. Another participant mentioned that System NCDs" are used offline and online. At Posbindu and puskesmas, data is recorded on form or paper first, then entered into the application (excel) offline, and then the Excel file is sent to the Health Office for entry by health service officers into the action system

NCDs. " To complete the data for "information system NCDs," the puskesmas sometimes retrieve data from the "e-pusk" application; there is no special application for the hospital. However, it is included in the Hospital Information System (HIS). This year, there is a new application called ASIK for all programs, including PTM and DM. The ASIK application is fully online, but it is still quite difficult to use (because it is still new and the training is very new), and you also have to re-train the cadres."
The constraints on the implementation of information systems experienced by participants are described below: "... there still likes to have double data when entered (reported twice), puskesmas often send wrong NCDs reports, reports were sent late to the health office because the puskesmas staff was busy, health center staff who hold NCDs programs often change, the existing programs at the puskesmas are solid, but the number of officers is limited, and for ASIK because it is online, cadres must provide internet data/quota access."

Budget

Information obtained from participants regarding the DM management budget at the health office and at Puskesmas was divided into two categories: budget type and budget constraints.

Budget Type

The type of budget received was revealed from the participant's statement that '...the available annual budget is combined with the PTM program. There are various sources of the budget at the health service center and at the puskesmas: APBN, or State Revenue Expenditure Budget; APBD, or Regional Revenue Expenditure Budget; BOK, or Health Operational Assistance; and for puskesmas, other than the source of the budget, this is taken from the BLU Public Service Agency. The budget from the public service agency at the puskesmas is managed by the puskesmas itself. To carry out the screening of the puskesmas in coordination with the ward for the provision of consumables from the ward budget (before COVID)... Budget in the laboratory for the purchase of reagents... In the health department, the budget is more for outreach, and in the hospital, there is no special budget."

Budget Constraints

Information from some of the participants about budget constraints is that "the budget from the central government is very dependent on the size and allocation of the central government, often not by local or regional needs; the budget is not optimal during the COVID pandemic; the budget is too limited; the budget is not sustainable every year."

Case Screening

The participants' answers were divided into two categories: screening types and screening targets. As stated by the participant, "the available annual budget is combined in the PTM program; screening with blood sugar examination; screening for DM in hospitals is carried out according to standard clinical guidelines." Meanwhile, the target screening cases obtained information that "screening was carried out on residents aged 15–59 years; some were screened in junior high school; screening, especially in the building, is not only for residents in the working area of the puskesmas; the results of the screening will determine if the DM suspect is treated according to the work area because it will be difficult if it is managed at the puskesmas if it is outside the area."

Integrated Health Services Delivery

The participant's answers were divided into three categories: a) service characteristics; b) service flow; and c) constraints. The characteristics of health services are integrated, involving many professions such as doctors, nurses, nutritionists, laboratories, health promotion, and pharmacy. The service flow Services at the hospital are carried out according to patient service standards; if patients have positive DM, then services are given according to the diagnosis of DM for those served at the Internal Medicine Clinic with a laboratory examination package (BPJS), including serving patients referred to suspected DM, and the results of the service are recorded in the patient's medical record; if it's routine, it's recommended to the prolanis group." The constraints in service were mentioned by the participant as follows: There are obstacles in referral services from hospitals to puskesmas depending on the hospital; there are patients whose blood sugar is checked more than once a month; while follow-up efforts for patients served include those referred to the hospital; there are obstacles in the referral service from the hospital to the puskesmas depending on the hospital; there are patients whose blood sugar is examined more than once a month; while efforts to do follow-up for patients served include those referred to the hospital."

Community Empowerment

The participant's answers were divided into two categories: the content of the empowerment and the community empowerment goals. The content and type of empowerment are conveyed through the following statement: "Inviting the community to carry out the Healthy Community Movement, or Germas, to provide education about DM disease, education is carried out while identifying cases in the field. Education continues at every meeting. Empowerment during home visits... contains material about being smart and obedient; material on how to take medicine; education for prolongs and health promotion are separate and uncooperative patient education."

The Community Empowerment Goals are expressed as follows: "People with home visits will collaborate within health promotion officers,... to the patient's family for patients whom the family drives to the puskesmas; in hospitals, a community of DM sufferers was formed to facilitate socialization, etc., empowerment of cadres; the puskesmas conducts training to cadres at least once a year; and in educational hospitals, it is carried out when examining patients in clinics."

DISCUSSION

Based on the answers from the participants and cross-checked with existing documents, the regulations and policies used in the implementation of DM prevention are quite complete, starting with policies that are national, namely Minister of Health Regulation No. 71 of 2015 concerning DM management, which is followed up with policies at the national level. Until a circular letter from the mayor of Cirebon, at the technical level, such as at the health office and health center, SOPs have been made. Even so, the existing regulations and policies do not specifically address the prevention of DM but, in general, the prevention of Non-Communicable Diseases (NCDs).

According to the researchers, even though the implementation of DM prevention is integrated with the prevention of other non-communicable diseases, it is better for things that are more technical to make specific policies or regulations regarding DM prevention. Regarding the content of the policy, apart from being generally concerned with non-communicable diseases, the policy technically has not yet integrated all

services, both at the basic level, such as health centers, clinics, and specialist practice, up to the hospital when referred. There are no rules governing DM handling that are integrated from technical services and DM counseling to DM case reporting.

As a result of the absence of these regulations and policies, the researchers found that related DM management programs in hospitals were less integrated with programs in the health office. The new hospital serves DM patients according to clinical service guidelines only. There is no link between programs at the health office, puskesmas, or doctor's practice. This is following research in Thailand. This strategy document provides clear guidance to address the increasing burden of diabetes and NCDs, and creativity is needed.

In this changing disease burden, linking this approach to decentralization, national and local governments need to adapt guidance from the central level to effectively address a health concern that affects all levels of society and, therefore, clearly define their role in the struggle to prevent and deal with the increasing burden of diabetes and other NCDs (Beran & Higuchi, 2013). By applicable policies, DM surveillance activities are carried out together in non-communicable disease prevention activities. The implementation is carried out passively in the building and acts directly on the community, with the target population aged more than 15 years, by health cadres through posbindu. This surveillance aims to capture new DM sufferers who were previously undetected.

In practice, if a person is found whose blood sugar test results are higher than normal levels, then the health cadre will refer the person to the puskesmas for further examination. If it turns out that the results lead to DM disease, then the patient will be recorded as a DM sufferer and will be handled according to the Standard Operating Procedure for DM sufferers. For better results, as has been done in Pakistan, the four main strategies to tackle the rising incidence of diabetes in Pakistan are: 1) creating a multidisciplinary team through capacity building of the health care professionals, including doctors, dieticians, diabetes educators, diabetes foot assistants, and program managers, in standardized, evidence-based protocols, enhancing their knowledge and skill in managing diabetes and their related comorbidities; and 2) promoting primary prevention and awareness all over Pakistan using screening methods such as risk assessment of Pakistan individuals for diabetes. 3) defining strategies for management and prevention of diabetes and complications through a forum such as the Pakistan Diabetes Leadership Forum (PFLF); and 4) implementing a nationwide diabetes care program including registrations, treatment, and referral protocols (Basit et al., 2019).

The information system (SI PTM) has been created and implemented. Filled out by officers at the puskesmas, then recapitulated by officers at the district health office to be reported to the province and the ministry of health. Nevertheless, unfortunately, this system is not integrated with services in the hospital. This has the potential for undocumented patient care at the hospital. This also shows that the data has not been integrated into one system because the hospital records and reports it in another format to the health service department at the health office.

The latest information has been made and introduced; a new information system called ASIK has been used as a substitute for SI PTM. Following applicable regulations, this information system is not specific to DM but to non-communicable diseases. It is very important to integrate DM patient data in an information system, such as the results of research conducted in Turkey that primary care services for CVD-DM require urgent attention, focusing particularly on the training of staff in public facilities, the integration

of patient data**,** referrals, and follow-up across all levels of the health system (Kilic, B., Kalaca, S., Unal, 2015).

The results showed that empowering health workers had made promotional and preventive efforts through education about DM during hospitalization and home visits, as well as identifying cases in the field, but more often during visits to clinics or hospitals and even if a family was accompanying them. This is consistent with the results of other studies, which state that educational interventions have increased the knowledge of diabetic patients about the disease, self-care, and long-term disease control. Patient education is thus an important component in the management of diabetes mellitus. In addition, education with a cultural approach has been proven to increase knowledge, attitudes, and skills in controlling blood sugar levels in West Java, Indonesia. The same condition shows that a cultural approach is very important in the Saudi Arabian environment for improving DM treatment behavior (Alharbi et al., 2016; Badriah et al., 2021).

The study found that DM services have been carried out in an integrated manner between professions in the form of interprofessional collaboration and a referral system that has been running optimally. This is under the results of a study in Iran that reported that doctors should use guidelines regarding glycemic control to treat diabetes patients. Apart from that, to increase the program's effectiveness and strengthen the referral system, the government must also provide adequate health facilities for the prevention and control of diabetes in the country. In addition, given the important role of the community and patients in the success of the diabetes program and its patient-oriented nature, they must pay more attention to their health through proper nutrition, sufficient physical activity, and awareness of physical health. Carried out collaboratively in the form of interprofessional collaboration (Faraji et al., 2015).

The results show that the budget for controlling non-communicable diseases, especially DM, is not optimal at the health office and health center levels. This factor can become an obstacle to implementing DM control programs, as reported in a study. The government should allocate more funds and interest to education programs. Furthermore, NGOs and the private sector should contribute to formulating and implementing diabetes prevention and control programs in the future (Faraji et al., 2015).

CONCLUSION

Policy studies using a system approach in surge capacity have been able to dig up various information on DM control efforts in terms of policy, organizational structure, DM surveillance, information systems, integrated services, case screening, budgeting, and community empowerment. However, there are several obstacles to optimizing DM control, including family involvement that is not optimal and budgets that do not meet needs. Therefore, for future researchers, further studies are needed regarding family involvement to create effective interventions in optimizing DM control, as well as further studies regarding budget reviews as needed so that they will support efforts to prevent an increase in the prevalence of DM.

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