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Impact of Performance-Based Capitation Policy on Referral Health Services for Diabetes Mellitus Participants in the National Health Insurance Program

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Abstract. The increase in the number of patients with Diabetes Mellitus, including the burden of service costs, encourages the implementation of policies to carry out secondary prevention at the primary health level, including implementing the Performance-Based Capitation (KBK) policy. This study aims to evaluate the KBK policy implemented in the National Health Insurance (JKN) program on health services for Diabetes Mellitus patients at Referral Health Facilities, using the Regression Discontinuity in Time (RDIT) method on BPJS Kesehatan Sample Data from 2015 to 2020. It was found that the implementation of the policy was not accompanied by a decrease in the level of health service visits at FKRTL, which was expected to occur after the implementation of KBK. These findings align with the results of qualitative deepening through in-depth interviews, where there are obstacles in the implementation of KBK in First-Level Health Facilities (FKTP), especially in encouraging the improvement of Diabetes Mellitus services. Improvements in KBK policies are needed both in determining indicators, targets, and other supporting policies in achieving FKTP performance to encourage improvement in the output of Diabetes Mellitus health services at FKTP.

Keywords: Capitation; Diabetes Mellitus; Jaminan Kesehatan Nasional; Pay for Performance; Performance Based

INTRODUCTION

Indonesia is currently facing a double burden of health services, where the management of infectious diseases is still a major concern coupled with the increasing burden of non-communicable diseases (non communicable disease) . Infectious diseases in Indonesia such as tuberculosis, diarrhea and respiratory tract infections are still risk factors for causing disability and death, in addition to increasing risk factors due to non-communicable diseases such as diabetes mellitus (DM) (Daniella et al., 2025; Ji et al., 2025; Lehrke & Marx, 2017; Pudiyanti & Afriani, 2020). Based on Studies Institute for Health Metric and Evaluation (IHME), diabetes mellitus in 2019 is the 3rd disease that contributes to disability and death in Indonesia, a significant increase compared to 2011 which was still ranked 7th (International Health Metric and Evaluation, 2022).

Indonesia itself is ranked 5th in the world for the number of DM sufferers which is estimated at 19.5 million people in 2021 and is expected to rise to 28.6 people by 2045, of which 73.7% are undiagnosed (Anstee et al., 2013; Rizqillah, 2025). This projection is in line with the results of the 2023 Indonesian Health Survey (SKI), where the prevalence of DM based on a doctor's diagnosis only reaches 2.2%, much smaller than the prevalence of DM based on blood sugar checks, which is 11.7% (International Diabetes Federation, 2021)(Kementerian Kesehatan, 2024).

The high burden of diseases due to DM, including the accompanying complications, will certainly have an impact on the costs that must be borne by both the community and the financing schemes that apply in Indonesia, including the National Health Insurance (JKN)

program. Through the JKN scheme, the cost of health services, whether preventive, curative or rehabilitative, which is individual, including the consequences of DM and its complications, both at first-level health facilities (FKTP) such as Puskesmas and Primary Clinics, as well as advanced level referral health facilities (FKRTL), namely health services in hospitals, are borne by BPJS Kesehatan. In its development since its implementation in 2014 until now, the cost of health services that must be borne by the JKN program has increased significantly, especially in non-communicable or chronic diseases which are often expensive or catastrophic. The cost burden of non-communicable diseases in the JKN program reaches 61.35% of all health service costs paid by BPJS Kesehatan, one of which is Type 2 Diabetes Mellitus (DM).(Kementerian Kesehatan, 2023)

Based on the Disease Account data of the JKN Scheme, DM disease is one of the non-communicable diseases (NCDs) that burden the JKN program, where the trend in 2017-2019 continues to increase and reaches Rp. 7.2 T or 10.61% of all NCD expenditures.

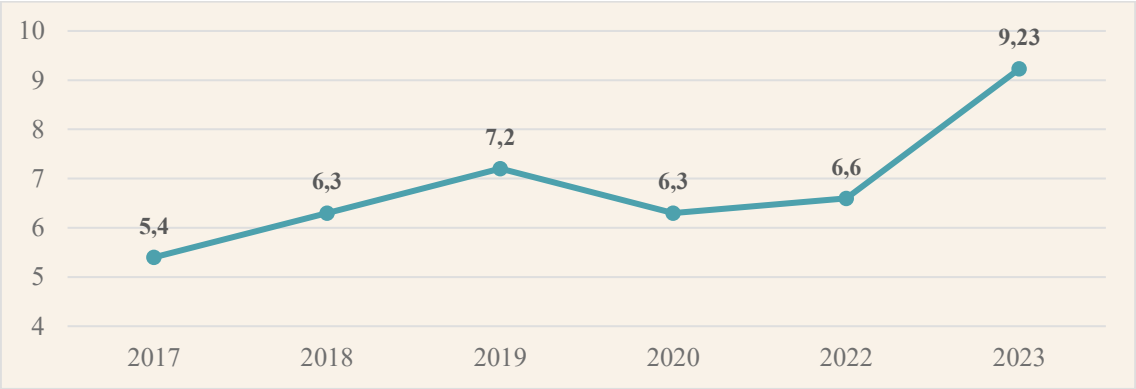

Figure 1. Trend of Diabetes Mellitus Service Costs in the JKN Program (Rp. T)
Source: Disease Account in the JKN Scheme in 2019 – 2020 and Diabetes Mellitus Pulse Dashboard BPJS Kesehatan

Meanwhile, based on BPJS Kesehatan data, the cost of DM services in 2023 has increased to Rp. 9.23 T for all types of services, both outpatient and inpatient. The increase in cases or service costs in question on the one hand shows that the JKN program has succeeded in becoming a program that improves (BPJS Kesehatan, 2024) Demand Health services for the community, but it is important to intervene to prevent higher costs in the future.

DM itself is a disease that can be managed or handled completely by a general practitioner at FKTP, treatment is carried out not to treat the body's metabolic function, but to control blood sugar levels through behavioral changes and drug administration, so that it can prevent or delay the occurrence of complications both acute and chronic. The strategies implemented by the Government of Indonesia in controlling DM disease include improving primary health services carried out at First Level Health Facilities (FKTP), such as Health Centers, Primary Clinics, Primary D Hospitals and Individual Doctor Practices. The specific target aimed at DM control is the implementation of early detection/screening of DM for participants at risk and control of fasting blood sugar in people with DM at the Health Center. The target aims to increase secondary prevention efforts for DM participants in FKTP to prevent complications or complications. Prevention efforts include providing adequate

treatment, controlling blood glucose levels, and early detection of complications, which are carried out from the beginning of DM disease management as well as education on the implementation of a healthy lifestyle such as a low-calorie diet and physical activity (Kementerian Kesehatan, 2020).

However, in addition to the high rate of undiagnosed DM disease, another challenge faced in carrying out DM management is the low number of DM patients who undergo routine treatment in health facilities. Based on a survey conducted by the Ministry of Health, only 59.2% of participants diagnosed with DM by doctors controlled or regularly went to health facilities. The lack of optimal management for DM participants who have been diagnosed with DM and the number of DM participants who have not been diagnosed certainly increase the potential for DM complications.

Complications that can arise due to DM include complications microvascular including damage to the nervous system, kidneys and eyes. While complications macrovascular including heart and blood vessel diseases, strokes and peripheral vascular disease which resulted in wounds that were difficult to heal until amputation was performed. Complications also have the potential to occur considering that DM can occur in all age groups and the prevalence of its occurrence begins to increase in the productive age group, so DM sufferers must make efforts to control blood sugar conditions from the beginning of being diagnosed with DM (Kementerian Kesehatan, 2024).

In line with the DM control target implemented by the Ministry of Health, currently the JKN program also implements a pattern pay for performance in the payment scheme for First Level Health services, where this pattern is commonly applied to social health insurance schemes or health financing systems in several countries (Gupta & Ayles, 2019). This pattern is similar to the policy stick and carrot applied to the management pattern, where the adjustment or deduction of per capita service tariff (capitation) payments as a form of punishment if the FKTP does not reach the set indicators. The tariff payment pattern based on the fulfillment of the indicators as mentioned has been implemented in 2015 in the form of a limited trial and expanded to be implemented in all Puskesmas as one of the FKTPs owned by the Regional Government, until September 2019. Since November 2019, changes have been made to the indicator-based payment policy in the form of expanding the FKTP target (including clinics), increasing the number of tariff cuts for health centers that do not reach the target and implementing indicators for participants with DM disease under blood sugar. (BPJS Kesehatan, 2019)

Based on BPJS Kesehatan data, of the 3 indicators implemented, 2 of them were not achieved nationally, namely participants with controlled DM and hypertension (4.11% of the 5% target) and contact numbers. The data is also supported by the results of the evaluation of the implementation of KBK where indicators that require participants with DM and Hypertension to be controlled cannot be fully intervened by FKTP, because there is a role in the behavior of participants and their families. In addition, the target of achieving blood sugar levels according to Perkeni standards is considered difficult to achieve by FKTP even with treatment or actions that have been taken by FKTP in DM participants. The non-achievement of the indicators of controlled DM participants is also concluded not only depending on the performance of the FKTP, but also lifestyle factors (routine treatment, diet-drinking, physical

activity) which are greatly influenced by culture and social environment.(BPJS Kesehatan, 2023)(Kementerian Kesehatan, 2023)(Trijayanti, 2023)

Several studies have been conducted to show the results of the implementation pay for performance (P4P) for health facilities for the control of Diabetes Mellitus. A study conducted on the implementation of P4P in Canada showed an association between an increase in the number of A1C tests (glycated haemoglobin), blood fat screening and eye complications due to DM after the implementation of the incentive policy for First Level Health facilities. Meanwhile, in a different study in Taiwan, there was evidence that the application of P4P with incentives in practicing physicians can reduce the risk of death of DM patients in the long term. This is because the implementation of P4P will increase doctors' efforts in providing sustainable health services for DM sufferers and reduce the risk of death.(Bamimore, Devlin, Zaric, Amit X, & Sarma, 2021)(Yi-Fang Wu, 2021)

However, the application of the Pay for Performance concept does not always provide effective results to improve the management of chronic disease services in primary care, considering that evidence on the impact of improving the efficiency of health service costs is still lacking (Gupta & Ayles, 2019). The success of indicators in the concept of pay for performance to measure the outcome of a service in supporting the success of type 2 DM control is highly dependent on the process of monitoring-evaluating services to participants, the level of difficulty of the indicator or the amount of incentives provided to health facilities. Different P4P implementation studies conducted in Canada to measure outcomes showed no impact resulting from the implementation of incentives for family physicians on preventable hospital health care services or costs (Gupta, Lavallée, & Ayles, 2019).

This study aims to evaluate the impact of Performance-Based Capitation (KBK) policy implementation on the utilization of Diabetes Mellitus (DM) health services at First-Level Health Facilities (FKTP) and Advanced Referral Health Facilities (FKRTL) in the National Health Insurance (JKN) program. Specifically, this research seeks to: (1) measure changes in the contact rate, visit rate, and frequency of visits for DM participants at FKTP and FKRTL before and after KBK implementation in September 2019; (2) assess whether the KBK policy successfully reduces the referral ratio from FKTP to FKRTL; and (3) identify implementation barriers and challenges faced by FKTP in achieving KBK performance indicators.

The benefits of this study are threefold. First, from a theoretical perspective, this research contributes empirical evidence to the literature on pay-for-performance schemes in developing countries' health systems, particularly in the context of chronic disease management. Second, from a practical standpoint, the findings provide actionable insights for BPJS Kesehatan and the Ministry of Health to refine KBK indicators, adjust performance targets, and strengthen secondary prevention strategies at the primary care level. Third, from a policy perspective, this study offers evidence-based recommendations to improve the governance of DM management in Indonesia's JKN program, ultimately supporting the national goal of reducing the catastrophic cost burden of non-communicable diseases while enhancing health outcomes for millions of DM patients.

The implications of this research extend to multiple stakeholders: policymakers can use the findings to reform payment mechanisms and incentive structures; health facility managers can better understand performance drivers and barriers; and ultimately, DM patients may benefit from improved quality and accessibility of care if recommended policy adjustments are

implemented. Given the projected increase of DM cases to 28.6 million by 2045 and the current cost burden of Rp. 9.23 trillion annually, evidence-based policy improvements are urgently needed to ensure the sustainability of Indonesia's health financing system while achieving better health outcomes for its population.

RESEARCH METHOD

This study used a quantitative approach with a quasi-experimental design to assess the causal effect of the application of Performance-Based Capitation (KBK) on the utilization of Diabetes Mellitus (DM) services in first-level health facilities (FKTP) and advanced referrals (FKRTL), but due to the unavailability of randomization, control groups, and limited data due to the Covid-19 pandemic, the Difference in Difference method cannot be used, so the Regression approach was chosen Discontinuity in Time (RDIT) which utilizes the time of policy implementation as a running variable to detect sudden changes (discontinuities) around the September 2019 cut-off (Cattaneo et al., 2019; Hausman & Rapson, 2018). Individual data on the 2015–2020 BPJS Kesehatan sample which included 143,496 DM participants (1% of the national sample) were aggregated to the district/city level, separated by type of FKTP (Puskesmas and Primary Clinics/Primary D Hospitals), and weighted using weighting according to a stratified sampling design (Ariawan et al., 2021) to calculate dependent variables in the form of contact rate, visit rate, frequency of visits, and referral ratio, both in FKTP and FKRTL (BPJS Kesehatan, 2019; 2022; Fenton et al., 2006; Sonmez et al., 2023). The independent variable is the implementation of KBK, while the control variable includes old age, gender, and JKN membership segments—especially the proportion of PBI participants which reflects economic conditions (Ministry of Social Affairs, 2019; Kosasih et al., 2022). To minimize the anticipatory bias of policy implementation, the study applied the donut hole technique by excluding observations one month before and after the cut-off (Hausman, 2018). The quantitative analysis was complemented by in-depth interviews with two health centers to validate the findings, according to a mixed-method approach that strengthens, expands, and explains the quantitative results. The RDIT model used assesses whether there is a significant discontinuity in the utilization of DM services in FKTP and FKRTL after the KBK is implemented, so that it can be concluded that the impact on the increase or decrease in the utilization of health services in the JKN program can be concluded.

RESULTS AND DISCUSSION

Description of BPJS Kesehatan Data Sample in 2015 - 2020

The DM contextual sample data for 2015 – 2020 consisted of a set of membership data, first-level health service data paid on a capitation basis, first-level health service data paid on a non-capitated basis, advanced health service data and secondary diagnostic data on advanced health services. DM participation included in the sample data amounted to 143,496 participants out of a total of 1,428,840 JKN participants who were diagnosed with DM in 2020. All provinces in Indonesia are represented in the DM contextual sample.

The data processing process is carried out by combining DM membership datasets aggregated at the Regency/City level with a combination of first-level service datasets paid on capitation and non-capitation. The next merger was also carried out on the DM membership

dataset which was aggregated at the Regency/City level with a combination of the advanced level service dataset with the secondary diagnostic details.

Table 1. Proportion of Characteristics of DM Participants Registered in FKTP

Variable Control	Registered Participants of the Health Center	Registered Participants of Primary D Clinic / Hospital	Registered Participant Practicing Physician
Gender			
Man	310.131	174.977	87.973
Woman	525.394	220.355	116.828
Participant Segments			
PBI	299.784	16.708	9.414
Non-PBI	535.741	378.625	195.388
Age			
Elderly	224.945	90.471	56.868
Non-Elderly	610.580	304.862	147.934

BPJS Kesehatan sample data for the 2015-2020 JKN service year represents observations of DM participant services in 482 out of a total of 514 regencies/cities and represents all provinces in Indonesia. Provinces and districts that have miscellaneous or unidentified values are excluded from observation. Participants by gender. DM participation included in the sample data of 143,496 participants or representing 1,428,840 JKN participants diagnosed with DM in 2020 was calculated from the individual weight in the participant sample.

Box plots or *whisker* plots obtained a median value (midpoint on the box graph) from the results of measurements of both *contact rate*, visit *rate* and frequency of visits showing an increasing trend throughout 2015-2020. The trend of using the first level of services for DM participants for the variables of contact *rate*, visit *rate* and frequency of visits at the Regency/City aggregation level tends to increase every year (RD score -57 is a measurement in January 2015). The data in question cannot show the performance between the Health Center and the Primary Health Center/Primary D Hospital. However, when compared between the use of services for participants registered in the two types of FKTP, it tends to be the same between FKTP and FKRTL, where the trend of service utilization in participants registered at the Primary Clinic resembles the Puskesmas. In fact, as is known, the performance-based capitation payment policy was only implemented at the Pratama Clinic/ RS D Pratama in September 2019 (RD/ Axis Score = 0). In a descriptive analysis, it can be found that there is no relationship between the implementation of KBK in the Puskesmas to increase the utilization of services at the Primary Clinic/Primary D Hospital, even though the characteristics of the two FKTPs are different.

Another thing that can be observed is that although there has been an increase *in contact rates*, visit *rates* and frequency of visits, there has been no significant change in the decrease in the ratio of participants referred by FKTP to services at FKRTL. The trend in question can be associated with the non-optimal role of FKTP in implementing the gatekeeper concept which plays a role in reducing the incidence of referrals to higher services.

As for the use of advanced health services, in line with the explanation in the Background Chapter, there continues to be an increase for advanced level services for DM participants.

Increasing the use of first-level services and improving the quality of services at FKTP is further expected to encourage the achievement of secondary prevention goals to prevent complications and complications of DM. In the long term, it is expected that there will be a decrease in the trend of DM services at FKRTL.

Qualitative Data Collection

As a form of validation and sharpening of the results of quantitative data processing using *the Regression Discontinuity Design in Time* (RDIT) method, in this study, primary data collection was also carried out through in-depth interviews at 2 Regional Government-Owned Health Facilities, namely selected Community Health Centers (Puskesmas). The implementation of in-depth interviews for this study was carried out at the Northern Region City Health Center and the Bolowerti Health Center which are Regional Public Service Agencies (BLUD) under the Kediri City Health Office. The selection of the two Puskesmas is intended to compare the perception and overview of DM services carried out by the Puskesmas and its relation to efforts to achieve performance-based capitation indicators.

Table 2. Achievement of Measurement of Indicators related to Diabetes Mellitus in Performance-Based Capitation in February 2020

Phc	Number of Registered Participants	Number of Registered DM Participants	Number of DM Participants Visited	Number of Prolanis DM Participants Controlled	% of DM Participants Contact FKTP	% of DM Participants Controlled
Balowerti	18.301	584	86	11	14,7%	1,88%
Northern Region Cities	13.436	272	140	6	51,4%	2,2%

In the context of achieving performance indicators in KBK, the two Puskesmas did not achieve the indicator of the % of DM participants who were controlled by blood sugar. However, in terms of efforts to provide services in the form of quantity, the Northern Region City Health Center makes a much higher effort in providing services for all DM participants at least once in 1 month. In-depth interviews for qualitative studies were conducted on the person in charge of the *Diabetes Mellitus* disease control program at each Health Center.

Hasil *Regression Discontinuity in Time*

Regression *Discontinuity in Time* (RDIT) analysis was carried out separately between participants registered at Puskesmas and Primary Clinics/Primary Hospitals with 4 approaches to ensure the sensitivity of the analysis, namely:

a. Stage 1 : without the use of *donut holes* and control variables
b. Stage 2 : with *donut hole,* without control variables
c. Stage 3 : with control variables, without *donut holes*
d. Stage 4 : using *donut holes* and control variables

The approach referred to above is used to analyze dependent variables related to the utilization of health services for DM participants consisting of *contact rate* (FKTP and

FKRTL), visit *rate* (FKTP and FKRTL), Frequency of Visits (FKTP and FKRTL) and referral ratio (FKRTL only). Discussions will be carried out for each type of dependent variable both at the first and advanced levels of health services.

RDIT was first carried out for the use of DM Health services at the first and advanced levels, regardless of the type of FKTP where participants are registered (Puskesmas or Primary Clinic/D Primary Hospital). Furthermore, RDIT was carried out again by distinguishing between the types of FKTPs where participants were registered, to get an idea of the difference in the impact of the implementation of KBK on different types of FKTPs considering the differences in characteristics between the Puskesmas and the Primary Clinic/Primary D Hospital. Different results were obtained, where the use of services of registered DM participants increased with a higher level of trust than participants registered at Private Clinics or D Pratama Hospitals.

Measurement of first-level health service utilization for DM participants in the program JKN was carried out through contact rate, visit rate, frequency of visits, and referral ratio, where the analysis of RDIT stage 4 using the donut hole approach and control variables showed a small but consistent increase in contact rates, visit rates, and frequency of visits after the implementation of KBK, especially in participants registered at Puskesmas—although the increase was not significant and was not followed by a decrease in the referral ratio to FKRTL so there was no shift utilization of services from the advanced level to the first level.

Although not significant, the increase in DM services at FKRTL occurred in the impact measurement for the entire analysis stage. The implementation of KBK actually caused an increase in the use of services at FKRTL in the form of a contact rate of 0.021 for all registered participants and an increase of 0.020 for participants registered in Puskesmas with a 95% confidence level. The increase in DM services at FKRTL is precisely in line with the increase in the contact rate at FKTP where the increase occurred for participants registered at the Health Center, while the increase in contact rate at FKRTL for participants of the Primary Clinic/D Primary Hospital cannot be concluded. The increase in the rate of DM service visits at FKRTL after the implementation of KBK also occurred in the processing of RDIT phase 4 for the total number of registered participants as much as 0.053 with a degree of confidence of 95% and in registered participants at Puskesmas as much as 0.047 with a degree of 99% confidence. Meanwhile, in participants registered at the Primary Clinic, the increase in the visit rate occurred by 0.099 with a degree of 95% confidence even though the rate of visits to the first level of services did not change.

The frequency/average visit of DM patients after the implementation of KBK also increased in processing for all registered participants by 0.026 with a degree of 95% confidence and an increase of 0.045 with a degree of confidence of 99%. As for participants registered at the Pratama clinic/D Pratama Hospital, the increase also occurred by 0.082 with a confidence degree of 95%. So it can be concluded that the KBK policy has not been effective in reducing the level of visits of DM participants at FKRTL so that the burden of DM services at the advanced level is still high.

Discussion

Based on the results of data analysis using *Regression Discontinuity in Time* (RDIT), it was found that the positive impact of the implementation of the KBK policy on increasing the

level of utilization of health services for DM participants in FKTP, both for *contact rate*, visit *rate* and frequency of visits. However, the increase does not reduce the ratio of DM patients referred from FKTP to FKRTL and reduce the level of utilization of DM patient services at FKRTL.

The Impact of Performance-Based Capitation on the Utilization of First-Level Services

The increase in service contact rate showed an increase in participant access based on the number of patients who received services at least once per month, where the results of the RDIT analysis showed an increase with a high degree of trust only in participants registered at the Health Center, while participants at the Primary Clinic/D Pratama Hospital did not experience changes after the KBK was implemented; likewise for the visit rate that increased significantly only in Puskesmas participants, while the frequency of visits increased in both types of FKTP. This increase in utilization is driven by changes in the KBK indicator in BPJS Kesehatan Regulation No. 7 of 2019 which focuses on the number of Prolanis DM participants whose blood sugar is controlled compared to all registered DM participants, so that FKTP is encouraged to increase contact, visits, and frequency of services as well as register DM participants to Prolanis in order to obtain reimbursement for laboratory examination fees, as well as by the capitation deduction mechanism of up to 15% for Puskesmas and 5% for Primary Clinic/D Primary Hospital if the target is not achieved which has an impact on employee service services (Ministry of Health, 2022). However, the use of services is still not optimal because there is *a moral hazard* of FKTP not to achieve the indicators due to the high level of difficulty and small punishment, for example, the capitation cut of the Primary Clinic is only around 0.125% and because the achievement of indicators is greatly influenced by participant compliance, so that the target of 5% of controlled DM participants is considered too high; the determination of performance targets should consider realistic room for improvement. In addition, complications are still possible even if treatment is carried out according to standards, as a study in the UK reported that vascular complications reached 70.3% (Hippisley-Cox & Pringle, 2004), and the implementation of KBK which is only in the form of punishment without reward until 2019 also caused a negative perception. Moral hazard can also arise through delaying the diagnosis of DM to suppress the indicator denominator, which actually risks increasing complications, contrary to the fact that 73.3% of people with DM in Indonesia have not been diagnosed (International Diabetes Federation, 2021). In addition, Prolanis' registration obligation to obtain supporting examinations can hinder services because FKTP can choose not to register participants; Therefore, Prolanis registration should be mandatory from the first diagnosis (BPJS Kesehatan, 2019).

Impact of Performance-Based Capitation on Advanced Health Care Visits

The increase in the utilization of first-level services is not followed by a decrease in the referral ratio to FKRTL, both for all participants and based on the type of FKTP, even though in terms of policy improvement of services at FKTP, it is expected to reduce the use of FKRTL; however, the RDIT model only captures immediate changes around policy points and is therefore unable to assess medium-long term changes. The increase in the use of FKRTL can occur because DM participants who are found to be FKTP are already in poor condition due to the high proportion of patients who have not been diagnosed, or because the quality of DM services at FKTP cannot be measured in this study so that participants may still experience complications even though they receive routine services.

Qualitative Data Findings related to the Implementation of Performance-Based Capitation in Selected Community Health Centers (Puskesmas)

Interviews with the Puskesmas were conducted to validate the quantitative findings and showed that the intermediate outcome indicators of DM participants with controlled blood sugar were seen as difficult to achieve because they were highly dependent on participant compliance, as stated by the respondents: "The obstacle may be that we cannot control every participant because many patients do not routinely control..." (Balowerti Health Center) and "If the patient sometimes has a problem who takes the medicine irregularly..." (Puskesmas Kota Wilayah Utara). Respondents also rated the target as too high and not proportional to the weight of capitation, as stated "... The Prolanis indicator is the hardest for Dok to achieve, but the points are only 10%..." (Balowerti Health Center) and "... There is no reward, but if it is not achieved, it will be punished..." (Northern Region City Health Center), so that the rewards in the Minister of Health Regulation No. 3 of 2023 are expected to change the perception of FKTP. Modifications to DM management in order to pursue indicators are also recognized, such as the tendency to only handle DM cases that are easy to control "What is involved in controlled prolanis only..." (Balowerti Health Center) as well as strict selection before entering a diagnosis of DM: "It is ensured that the criteria are correct... before being entered as a participant in the DM prolanis (North Region City Health Center). In addition, the lack of optimal utilization achievement is also triggered by the non-integration of the P-care system with the FKTP information system for data collection, reporting, and follow-up of DM participants, for example "Now yes, there is, but in the stars... I don't know the address..." (Balowerti Health Center) and "We have not been able to be as perfect as a cohort that can remind patients..." (Puskesmas Kota Wilayah Utara). Finally, the quality of FKTP services needs to be improved because facilities, infrastructure, and drugs are still not always available. (Balowerti Health Center) as well as the limitations of supporting examinations such as HbA1c which complicate the evaluation of therapy (Puskesmas Kota Wilayah Utara), in line with the quantitative findings that the increase in the quantity of services is not enough to suppress referrals to hospitals.

Research Limitations

Large-scale social restrictions (PSBB) since April 2020 due to the Covid-19 pandemic have led to a sharp decline in the use of health services, including visits of DM participants at health centers, so this study only uses data up to March 2020 to avoid bias; in addition, the implementation of Performance-Based Capitation (KBK) does not apply evenly because some FKTPs such as those with fewer than 5,000 registered participants or are in areas without internet access are excluded from the capitation cuts, but the information cannot be analyzed due to the limitations of BPJS 2015-2020 data which does not contain FKTP identities and the number of registered participants. The assessment of the use of DM services also has the potential to be biased because the visit data covers all diseases without being able to distinguish between pure DM visits, comorbidities, or complication conditions due to incomplete diagnosis recording at the FKTP, as well as the unavailability of data on blood sugar test results and Prolanis DM membership; In addition, the sample data does not fully reflect real utilization because it is influenced by access barriers, JKN service procedures, and the tendency of participants with low economic status to use JKN more than middle-upper economic

participants who may choose private insurance. The *Regression Discontinuity in Time* (RDD in Time) method used only captures discontinuity in the period around the implementation of the policy so it is not ideal for assessing long-term service shifts, and this study also cannot assess the quality or effectiveness of DM services because it only measures the intensity or quantity of services in FKTP and FKRTL.

CONCLUSION

Since its implementation in 2019, the Performance-Based Capitation (KBK) policy expanded coverage to all types of FKTPs and adjusted per capita payments based on performance, with special indicators for Diabetes Mellitus (DM) patients aimed at improving service quality and reducing long-term costs from complications. However, analysis using Regression Discontinuity in Time on BPJS Kesehatan data from 2015 to 2020 showed that the policy did not reduce referrals to advanced health facilities (FKRTL); rather, DM service utilization at FKRTL increased, indicating patients' conditions remained uncontrolled. This suboptimal outcome is attributed to excessively high indicator targets, imbalance between workload and incentives, and negative perceptions of disincentives in the KBK system. Additionally, impact assessments were limited by pandemic-related data anomalies and aggregation issues. Future research should focus on post-pandemic data at the health facility level to better evaluate KBK effectiveness and guide recommendations for improving KBK indicators, reinforcing early DM detection and screening programs, enhancing chronic disease management obligations, innovating teleconsultation to improve compliance, and adjusting capitation incentives to ensure equitable benefits across all FKTP types, ultimately optimizing DM care under the National Health Insurance (JKN) program. This research would provide critical evidence to support policy refinements by BPJS Kesehatan and the Ministry of Health.

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