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# Evaluation of chronic disease management programs in developed and underdeveloped regions in Indonesia

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## ABSTRACT

**Introduction:** Chronic diseases have become a major cause of death in the world, and a major source of morbidity and misery. Approximately 80% of related deaths occur in developing countries. Chronic Disease Management Program (CDMP) is an integrative program aimed to control the prevalence of chronic diseases. Therefore, this study aimed to evaluate the interaction between context and process in CDMP services, and to determine how CDMP was implemented in developed and underdeveloped regions.

**Methods:** This qualitative study used the Consolidated Framework for Implementation Research (CFIR). Subjects were selected by purposive sampling from CDMP organizers in Primary Health Centers for a commitment-based capitation assessment. Transcript data were analyzed thematically by summarizing and identifying major themes based on the CFIR domains.

**Results:** The main activities of the CDMP (medical consultations, monitoring of health status, health educational, reminders, home visit and group activities/gymnastics) in developed regions were conducted according to the technical manual. However, in underdeveloped regions, some modifications were needed, i.e. the medical consultations, medical checkups and health education undertaken by a nurse in charge and not always conducted by a doctor; and, the services were conducted at the village meeting halls. Also, the reminders were delivered through socialization by local governments and direct invitation by team members when they met the participants on the roadway or in the neighborhood around the participants' homes.

**Conclusion:** CDMP cannot fully be implemented in underdeveloped regions and some modifications were needed according to local conditions.

**Keywords:** Chronic Disease Management Program, developed regions, underdeveloped regions, Consolidated Framework for Implementation Research.
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## INTRODUCTION

Chronic diseases is a major cause of death worldwide,[1,2] and responsible for a significant morbidity and economic burden.[3-4] Approximately 80% of related deaths occur in developing countries.[5,2] The prevalence of chronic diseases is expected to rise continuously in the future[3,6] along with the increases of life expectancy and epidemiological transition[5,6] among people in developed and underdeveloped regions.[6]

Research showed that many countries have undertaken efforts to prevent and control chronic disease by implementing the Chronic Disease Management Program (CDMP) in their National Health System[1,2,4,7] with the goal of 25% reduction of premature deaths due to non-communicable diseases (NCDs) in 2030 according to the World Health Organization (WHO) and United Nations (UN) targets.[2] In 2010, Indonesia began to implement the CDMP managed by PT. Askes/Health Assurance. In 2014 with the enactment of the National Health Insurance (JKN), the CDMP was integrated into the JKN program, and organized by the National Social Security Agency for Health (BPJS) and Primary Health Facility (PHF) as preventive and promotive programs.[8] The CDMP has 6 main activities: namely, medical consultations, monitoring of health status, health education, reminders, home visit, and group activities (calisthenics/gymnastics).[9]

The implementation of CDMP in the developed countries has been successful in several countries.[10] However, the underdeveloped regions has limited resources which make the full implementation of CDMP challenging. Therefore, the aims of this study were to describe the interaction between the context and process in CDMP services and to determine how the CDMP can be successfully implemented in the developed and underdeveloped regions.

## METHODS

### Research Design and Subject

Indonesia consists of 34 provinces and 514 districts/cities with a wide range of social, economic, geographic, and demographic backgrounds. Based on accelerated and equitable development, the government decided underdeveloped regions would be evaluated every five years.[11] Most of the underdeveloped regions are in Eastern Indonesia, particularly in the region of Borneo Island, Sulawesi, Nusa Tenggara, Maluku, and Papua.[11]

This research selected the Sleman District of Yogyakarta, located in the Western region of Indonesia to represent the developed regions and East Flores District of East Nusa Tenggara Province located in the Eastern region of Indonesia to represent the underdeveloped regions. This study was an implementation research[12,13] that conducted by using qualitative methods,[14] to evaluate the interaction between the context and process of CDMP services using the Consolidated Framework for Implementation Research (CFIR).[15-16] The populations of this study were all PHFs in Sleman including 25 Primary Health Centers, 54 clinics and 488 Private Practice Doctors (DPP). In East Flores there were 21 Primary Health Centers and 2 DPP. East Flores only has two DPP and no clinics. Purposive sampling was used to select the subjects and involving the Primary Health Centers with CDMP services and those which used a commitment-based capitation (CBC) assessment. From each region, five Primary Health Centers were selected.

### Data Collection Procedures

The study was conducted over eight months from October 2018 to May 2019. The data were collected by interviews, observations and document study. Guidelines of interviews were based on the domains of CFIR (Table 1) to assess the implementation of the main activities of the CDMP.

The researchers conducted interviews with five informants from the program leaders or team members as well as one person from the developed region for data triangulation. Additionally, 19 informants were included from the underdeveloped regions which consisted of 10 informants, 5 of Primary Health Centers leaders, and 4 triangulation persons. Before the interview was conducted, the informant was explained the design and objectives of the study, and the participants were asked to sign the informed consent form if they agreed to participate. Interviews were conducted in the office of informants or Primary Health Centers. Observations and document study were done before, during, or after the interviews according to the conditions. All conversations were recorded, and the observations as well as document study were recorded or documented with a camera. The interview tapes were transcribed word for word.

**Table 1. The consolidated framework for implementation research domains**

| Domain | Construct |
|---|---|
| Intervention characteristics | Intervention sources |
| | Evidence strength and quality |
| | Relative advantage |
| | Adaptability |
| | Trial |
| | Complexity |
| | Design Quality and Packaging |
| | Cost |
| Outer Settings | Patient needs and resources |
| | Cosmopolitanism |
| | Peer pressure |
| | External policies and incentives |
| Inner Settings | Structural characteristics |
| | Networks and communications |
| | Culture |
| | Implementation climate |
| | Readiness for implementation |
| Characteristics of Individuals | Knowledge and beliefs |
| | Self-efficacy |
| | Individual stage of change |
| | Individual identification with organization |
| Implementation Process | Planning |
| | Engaging |
| | Executing |
| | Reflecting and evaluating |

### Data Analysis

Transcript data were analyzed by summarizing, then selecting the main themes in the data matrix based on the domains of CFIR.

## RESULTS

### Intervention characteristics

#### *Adaptability*

The implementation of the main activities of the CDMP could be modified according to local conditions. In the developed regions, the CDMP services were performed in public clinics or special clinics. The reminders were delivered through a direct message by the team at the end of the services and sending short messages via mobile applications (Whatsapp Group). In underdeveloped regions, the CDMP services were conducted at the village meeting halls and the reminders were delivered by direct messages at the end of the service by the team. The distribution of annual schedule to the village was put up on the bulletin board and announced over loudspeakers at night before the activity of CDMP the next day. Sometimes the direct information was given from the team to the participants when they met on the street or the neighborhood of participants. If some participants did not attend, the team would meet them at their home.

> …to remind the participants, we sent short messages through mobile app (Whatsapp Group)… (Informant 2)
>
> …to remind the participants in the village, there was microphone that we could use, we asked permission to the secretary of the village government the night before CDMP services regarding the announcement… (Informant 17)

***Complexity***

The main obstacles encountered by the team in the developed regions were the claim process and no elderly attended the events. Also, rain often became the primary reason for the participant to be absent.

> …actually, if we try harder we can manage, the only complicated part is in claiming process… (Informant 1)

The obstacles in the underdeveloped regions were the schedule changes or cancellations due to death or mourning, the rainy season, or the growing season. There were also mass social work activities and schedule conflict or other activities which often happen to doctors.

> …The constraints are when it is rainy season, or one of the villager died, and there are certain activities in the village, thus the CDMP service is usually delayed…. (Informant 9)

***Costs***

The costs of preparation and implementation of the services were documented. In the developed regions, the CDMP service costs were budgeted in the Business Plan and Budget document of Public Service Agency of Primary Health Centers with the CDMP service account.

> …For the cost, it was included in Business and Budget Plan, using service account…. (Informant 1)

In underdeveloped regions, the budget was in the use of Budget Document from Primary Health Centers which included in the travel expenses.

> ...fund from Primary Health Centers, we are allocating the cost for activities outside of the building... (Informant 15)

**Outer Settings**

***Patient needs and resources***

Participants' needs for CDMP services and their satisfaction could be fulfilled by Primary Health Centers. The participants in developed regions felt happy, and they need this kind of group activity especially for the participants who live alone in their house.

> ... most of our participants live alone, now there are many friends, so it's kind of refreshing place in here... (Informant 4)

Participants in underdeveloped regions were glad because health care services were nearby and they felt treated differently than other elderly people.

> …. they felt that the health services became more accessible, so they were happier. And they felt as if the health workers personally paid more attention to each of them compared to the other elders… (Informant 13)

***Cosmopolitanism***

Primary Health Centers had cooperation with other parties in the CDMP services. In the developed regions, Primary Health Centers facilitated the cooperation between CDMP clubs with a gymnastics instructor.

> …we facilitated the cooperation with gymnastics instructors while the club managed the schedules… (Informant 1)

In the underdeveloped regions, Primary Health Centers were cooperating with the government village to provide a schedule of activities and the dissemination of scheduled activities.

> …we talked to the head of the village government, they voluntarily provided the place and announced the schedule, sometimes they mobilize the participants to come… (Informant 15)

**Inner Settings**

***Structural characteristics***

Concerning the architectural team of the CDMP services, in developed regions, the team was assisted by club officials (chief, secretary, and treasurer), however, in underdeveloped regions, the team was assisted by a cadre of Integrated Service Centers or *Posyandu*.

> … There are only three of us here, there is also a club administrator who helps…. (Informant 4)
>
> …here, there were health cadres assisting... (Informant 17)

***Readiness for implementation***

Primary Health Centers in the developed regions have implemented CDMP since 2014, with the CBC's introduction already in place. In the underdeveloped regions, Primary Health Centers began organizing the CDMP in 2018 and the preparation was required such as the appointment of the responsible staffs, participant networking, and financing. The heads of Primary Health Centers understood that the CDMP services could be an indicator of the CBC ratings even though the conditions and resources required for the Primary Health Centers were not ready, since they were just beginning to organize the CDMP services.

> … There was no assessment in 2014, then in 2016 it was told that CDMP was the CBC indicator and we were ready... (Informant 5)
>
> ... BPJS said that in 2018 we would have to provide CDMP services. if we did not provide CDMP, we would definitely enter the unsafe zone, so that CDMP was required for all Primary Health Centers despite the lack of manpower and no funds... (Informant 14)

***Characteristics of Individuals***

Teams in the developed regions have a better level of understanding than the teams in underdeveloped regions. The individual characteristics of the two teams were similar in terms of confidence in abilities, knowledge, skills development, service improvement, discussion, and consultation. The Primary Health Centers capitation had significant impact on the CDMP services.

> …if it's not safe we cannot get 100% capitation so it's only paid 95%.... (Informant 4)
>
> ... the CDMP as assessment indicators of CBC would be small services in the unsafe zone .... (Informant 19)

**Implementation Process**

***Planning***

Preparatory steps of the CDMP services, including the networking with participants in developed regions, were conducted by outpatient registers, however, in underdeveloped regions it was done at Posyandu registers from the villages.

> … we begin with patients in general polyclinic…. (Informant 2)
>
> …for the participants, I recruited from register for elders, we chose only the nearest villages… (Informant 11)

**Table 2. The interaction between context and process in the CDMP implementation in developed and underdeveloped regions**

| Domain and Construct Of CFIR | Main Activity of CDMP and Process | Results | | | |
|---|---|---|---|---|---|
| | | Developed regions | Analysis | Underdeveloped regions | Analysis |
| **Intervention Characteristics** | | | | | |
| Adaptability | Locations of CDMP services | • In general, or special polyclinics | • Good in health seeking behavior.<br>• easily accessible Primary Health Centers. | • Village meeting halls | • There was a local culture such as "what will we get (medicines) if we go to the Primary Health Centers?"<br>• The location of the Primary Health Centers is far from the village.<br>• There is no public transportation |
| | Reminder | • The team sent short messages through mobile app (Whatsapp Group) | • One of the requirements for club member's is to have a mobile phone<br>• Primary Health Centers has Internet connection | Undertaken through several methods:<br>• The team distributed the annual schedules to the village by sticking them in information board and announced by using loudspeaker a night before CDMP service held.<br>• The team informed directly when they meet the participants on the way or in the neighborhood around the participants' homes. | • Not all participants have mobile phone<br>• Not all villages have Internet access<br>• Primary Health Centers did not have Internet connection |
| Complexity | | Claim process | • Time constraints due to officers' double work. | • The shifting or cancellation schedules caused by funeral, rain, cultivation season, or community service. | • High spirit of mutual cooperation. If there are activities involving the community such as death, group service or individual activities are canceled. |

| Domain and Construct Of CFIR | Main Activity of CDMP and Process | Results | | | |
|---|---|---|---|---|---|
| | | Developed regions | Analysis | Underdeveloped regions | Analysis |
| Cost | | Budgeted in Business and Budget Plan of Public Service Agency of the Primary Health Centers in special account of CDMP services. | | Budgeted in Budget Implementation Documents of the Primary Health Centers as outside the building activity | • The CDMP services are carried out in conjunction with elderly Posyandu services in the village meeting halls. |
| **Outer settings** | | | | | |
| Patient needs and resources | | The participants felt happy, and they need such group activities since some of them lived alone in their homes. | | The participants felt delighted because health facilities became more accessible and they were treated specially, different from the other elders' treatment. | • The CDMP members are JKN participants<br>• Club members were given snacks while elderly Posyandu participants were not given. |
| Cosmopolitanism | Cooperation in CDMP services | The team facilitated the cooperation between the club and the gymnastics instructor. | | The team had been doing unwritten cooperation with the village government in order to provide place and distribute the schedules. | • The cross-sectoral collaborations in public health efforts. |
| **Inner settings** | | | | | |
| Structural characteristics | Tasks Delegation | The team was assisted by the club management (leader, secretary, and treasurer) | | The team was assisted by the cadres of the integrated health services for the elders. | • Club managers have not yet formed. |
| Readiness for implementation | CDMP as one of the assessment indicators of capitation payment (2017) | More prepared because CDMP services has been conducted since 2014. | • Officers and participants are familiar with CDMP services | Still need preparation such as assigning staff as the responsible person, recruiting the participants and budgeting since they have just started organizing CDMP in 2018. | • CDMP services are new in the Primary Health Centers. |

| Domain and Construct Of CFIR | Main Activity of CDMP and Process | Results | | | |
|---|---|---|---|---|---|
| | | Developed regions | Analysis | Underdeveloped regions | Analysis |
| **Characteristics of Individuals** | | | | | |
| Knowledge and beliefs, Self-efficacy, Individual stage of change, Individual identification with organization | | The teams in both regions had the same confidence in their abilities. The improvements of the services were attempted through discussion and consultation. They realized CDMP services influenced the capitation of the primary health care and automatically impacted to the care services as well. | | • The spirit of learning and the willingness to improve became the motto of the team.<br>• Welfare is the motivation in providing health services. | |
| **Implementation Process** | | | | | |
| Planning | The recruitment of the participants. | Via outpatient register. | Club members include all residents in the Primary Health Centers working region. | Via the register of integrated health services for elders in the nearest villages from the primary health care. | • Club members are based on elderly Posyandu participants. |
| Engaging | Assigning the responsible person or team for CDMP program | Nurses and doctors worked in general polyclinics. | | Health workers (nurses), the responsible person for elders and or Posbindu PTM programs. | Because of the limitations of human resources, it results in multiple positions for one person. |
| Executing | The services followed the technical guidelines | Appropriate with the technical guidelines. | | Modified based on the resources. | |
| Reflecting and evaluating | The participants | The participants in both regions felt satisfied. | | | |
| | BPJS | BPJS in both regions sent report feedback monthly via email and utilization review every three months. | | | |
| | Team | In both regions, the monthly evaluations were undertaken when mini workshop held. Members of the team were generally satisfied with the services they provide, and they were happy to see their patient's quality of life improved. | | | |

### *Engaging*

The designation and involvement of the right individuals relied on responsible persons and team members. In the developed regions, the nurses and doctors on duty at public clinics were selected as a team. In the underdeveloped regions, the elderly programs or integrated development post of non-communicable diseases (Posbindu PTM) managers were designated as the person in charge for CDMP and the doctors as team members.

> … there is a team which consist of me as the doctor and the general polyclinic nurses…. (Informant 3)
>
> …the organizer of elders' program and Posbindu PTM was responsible for the CDMP program as well… (informant 12)

### *Executing*

The quality of implementation could be determined by the compliance to implement the planned actions, the timelines of completion of the task, and the level of individual involvement in the implementation process. In the developed regions, the CDMP services generally proceeded according to the technical guidelines issued by the BPJS in 2014. In underdeveloped regions, some modifications of the CDMP main activities were found such as health status examination which was not conducted by the doctor, the were done for only 1 time/month, and the obstacles of internet connection that was reported on P-Care applications that was used outside the clinic or collected at home or in the BPJS's office.

> ... sometimes if the doctor often leaves early from Primary Health Centers, it would affect our services .... (Informant 20)

### *Reflecting and evaluating*

Club members' assessment of the process and benefits of CDMP services were

considered with evaluations from BPJS with CBC assessment indicators, as well as personal and team viewpoints of progress of the CDMP services (reflections). In both regions, participants stated that they felt happy and satisfied with the CDMP services. Evaluation of the CDMP services as an indicator of the CBC was conducted every month by BPJS by sending feedback via email, while the CDMP service evaluation was done every 3 months through utilization review meetings. Evaluation of the Primary Health Centers was conducted through mini-workshops. Members of the team were generally satisfied with the services they provided and they were happy to see their patient's quality of life improved.

The interactions between context and process in the implementation of the main activities of CDMP in developed and underdeveloped are regions summarized in Table 2.

## DISCUSSION

The success of the implementation of CDMP is significantly determined by the availability of resources (human resources, infrastructure, funding). In developed regions with good resources, CDMP was successfully implemented based on the technical instructions. While in remote regions with limited resources, the success of the implementation of CDMP was a challenge. The key was the perception of the head of the Primary Health Centers related with the function and requirement to implement CDMP so that they could develop different implementation strategies.[17]

We found that the head of the Primary Health Centers in remote regions had the perception that the service of CDMP had influenced the number of capitations that would be accepted by the Primary Health Centers. Therefore, although the center had limited resources, the Primary Health Centers would continue to implement CDMP services with the modification in the main CDMP activities.

The services of CDMP were conducted at the village meeting halls at the same time with the integrated service for the elderly and Integrated Coaching of Non-Communicable Diseases because most of the Primary Health Centers were not easily accessed geographically (the location of the health center was far from the settlement with limited public transportation).[18] In addition, there was a culture that developed in the society (especially those with chronic diseases) that they would ask what they would get (in terms of money) when they visited the Primary Health Centers. They tended to go to the Primary Health Centers when they were functionally limited and disabled.

Medical check-ups were not always conducted by a doctor, but could be by the nurse in charge of the program. From the point of view of the Regulation of the Minister of Health of the Republic of Indonesia number 75 of 2014 concerning the Primary Health Centers,[19] in which the non-inpatient Primary Health Centers in each region required at least one doctor was supported in the findings. However, according to National Health Insurance, one of the functions of the Primary Health Centers is as the gatekeeper executor.[20] The Primary Health Centers is the first place visited by the community members every time they had health challenges in order to reduce further visits to other health facilities. The Primary Health Centers screened the services that needed to be referred and then arranged the referral system. Therefore, doctors could spend more time for curative services (Individual Health Efforts rather than Community Health Efforts).

A similar case also happened in the double jobs for nurses in charge of the program. The standard number of resources in non-inpatient Primary Health Centers in village regions were 19 people. We found that the number of the human resources in each Primary Health Centers were more than required which were approximately 20-35 people, but the level of education and the working experience determined the ones that became the consideration of the head of the Primary Health Centers to be given the responsibility to be in charge of the program. Another consideration was that integrated services for the elderly, integrated coaching for non-communicable diseases, and CDMP had the same goals and targets, namely helping the elderly and patients with chronic non-communicable diseases.

The success of health program development requires the integration across programs and sectors. The cross-sectoral cooperation includes the involvement of the community in the implementation of the program.[21] In order to remind and motivate the community to regularly join CDMP services, the Primary Health Centers worked together with the local government, and this approach was proven to be effective. The research indicated that digital based behavioral intervention has an effective potential in managing chronic diseases,[22] but a reminder with cellular application in remote regions was difficult due to a lack of internet availability and the habits of using the direct person-to-person approaches. Verbal communication between the team and the participants also proved to be effective in motivating the participants to join monthly CDMP services.

Despite of the findings, the weakness of this study is that the subjects were limited to only from Primary Health Centers, while the category of First Level Healthcare Facility (FKTP) includes Primary Health Centers, clinics, DPP, and hospitals type D. However, this article can be used as a basis for further and more comprehensive research in the future and to highlight the discrepancy in the application of CDMP between developed and underdeveloped regions in Indonesia.

## CONCLUSIONS

The successful implementation of the national program was influenced by the social characteristics, resources, and local wisdom. The findings of this study provide an overview of the implementation of CDMP services in terms of context and process. In underdeveloped regions, services were performed at the community/village simultaneously by Posyandu or Posbindu PTM personnel, leading to dual to triple duties (a person was responsible in elders, Posbindu PTM, and CDMP programs, concurrently), the medical checkups and health education were undertaken by a nurse in charge, and reminders were delivered through mobile apps (person-to-person message). Meanwhile, scheduled distribution and socialization were facilitated by the village government and direct invitation

(delivered by the team).

The results of this study are expected to provide an overview of underdeveloped regions for stakeholders who want to better organize the CDMP. However, further research related to the implementation of modifications is required.

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## CONFLICT OF INTEREST

This research was funded by the authors and the authors have no conflicts of interest.

## ETHICAL CONSIDERATIONS

This study received ethical clearance issued by the Medical and Health Research Ethics Committee of the Faculty of Medicine, Public Health and Nursing, Universitas Gadjah Mada, Indonesia with Reference Number: RCF: KE / FK / 0902 / EC / 2018.

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## AUTHOR CONTRIBUTION

All of the authors contributed equally in the research execution and writing process of this article

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