


Issues and Challenges in Implementing Care Coordinator in Primary Healthcare in Malaysia: A Qualitative Study

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Abstract

Background: Primary healthcare is the earliest gateway for patient care, and improvisations are often needed to accommodate the ever-increasing demand in public health. The Enhanced Primary Healthcare (EnPHC) initiative is aimed at improving such needs, and one core intervention is the introduction of a care coordinator (CC). The purpose of this study was to identify barriers and facilitators in implementing a new intervention in primary healthcare clinics. **Methods:** This qualitative exploration study. All healthcare providers who were involved in EnPHC at the intervention clinics were selected as participants. In-depth interviews and focus group discussions were carried out among healthcare providers working in the intervention clinic. Thematic analysis was used to categorize data, based on the consolidated framework for implementation research (CFIR) theoretical framework domains. **Results:** A total of 61 healthcare providers participated. All 5 domains with 19 CFIR constructs emerged from the analysis. Inner setting played a significant role in facilitating CC intervention, in which culture, networking, and collaboration and leadership engagement played an essential role in supporting CC activities. Although CC tasks are complex, concerns of losing clinical skill and resource constraints were identified as potential barriers in CC implementations. Criteria for appointing new CCs emerged from the characteristics of individual constructs, in which the individual must be familiar and interested in community health, have good communication skills, and at least 3 years' experience in the primary healthcare setting. **Conclusion:** The implementation of the CC intervention faces varying challenges in different settings. This is partially resolved through teamwork, guidance from mentors, and support from superiors. The complexity of the responsibility of the CC intervention is perceived as both a validation and a burden. Above all, it is seen as paramount in EnPHC intervention.

Keywords

care coordinator, primary healthcare, qualitative

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Background

Chronic diseases are defined by their long duration and slow progression; the current challenge for health systems is not only in managing the specific chronic disease, but also in caring for multi-morbid individuals.^{1,2} Managing patients with chronic diseases often involves multiple providers in various settings, as well as coordination for their complex care. Most people with a chronic illness, such as diabetes mellitus, hypertension, and asthma, receive care from primary healthcare providers.^{3,4} The coordination of care across clinicians and sites is a defining characteristic of primary healthcare and is of critical importance for persons

with chronic disease. Coordination of care is essential for good health outcomes. *Coordination of care* is defined

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as “the deliberate organization of patient care activities between 2 or more participants (including the patient) involved in a patient’s care to facilitate the appropriate delivery of health care services. Organizing care involves the marshalling of personnel and other resources needed to carry out all required patient care activities, and is often managed by the exchange of information among participants responsible for different aspects of care.”⁵ Organizing the personnel and resources needed to perform the activities required for patient care services might be useful in delivering care to patients with chronic disease.

In his study, Bodenheimer et al⁶ highlighted that we failed to address chronic disease management, because, at point of consultation, patients are medically stable but slowly developing a future problem. He described it as a “tyranny of urgency,” where the system was designed to address acute cases rather than chronic disease, and to not use non-physician personnel in patient care management. Several studies have shown that the intervention of non-physician personnel, such as a care coordinator (CC) in primary care, can be more effective in delivering health services. There are several variations in the CC’s role in literature, such as helping patients navigate through the system, communicating information across clinicians and settings, assisting patient engagement, addressing patient needs, providing gap care management, pre-visit planning, and transition of care contacts,⁷⁻¹⁰ which improve health outcomes and adherence to instructions given in clinical visits. The CCs interviewed in this study were registered nurses, social workers, or community health workers with an educational background in nursing or counselling. Type 2 diabetes mellitus and hypertension are rising to prominence among the chronic diseases in Malaysia. The National Health and Morbidity Survey in 2015 revealed a type 2 diabetes mellitus (17.5%) and hypertension (30.3%) prevalence among Malaysians over 18 years old.¹¹ The increasing chronically ill population is posing challenges to the primary healthcare clinics in the public sector. In response to these health changes, the government of Malaysia has been building its commitment and reorienting health policies to address prevention and control of non-communicable disease (NCD). National Strategic Plan for Non-Communicable Diseases (NSP-NCD) 2010-2014 was developed in line with 2008-2013 Action Plan in the Global Strategy for the Prevention and Control of NCDs mandates from the World Health Organization (WHO).¹² Strategies to improve preventive care in reducing NCDs were then translated to primary healthcare, as primary healthcare is the first point of contact for patients and their families to the healthcare system.¹³ Primary healthcare provides comprehensive, coordinated, and continuous care for the public.^{4,14} Services provided range from infant to geriatric care: termed by some as “womb to tomb” services. Malaysian healthcare’s open-door policy has also made it difficult to coordinate care for patients with chronic disease, as patients can seek treatment at any location at any time

from any medical doctor.⁴ Currently, Malaysia is considering re-organizing healthcare services for chronic disease management in the primary healthcare system. At present, there is no specific function or systematic way to monitor whether patients received effective healthcare at the clinics or other parts of the health system. As medical records are not shared between healthcare providers, duplication of laboratory and radiological analyses, as well as lists of medications prescribed occurs in the system.³

Ministry of Health Malaysia (MOH) has chosen a systematic approach to manage NCD at primary care level through prevention, early detection, and treatment of NCD. The systematic approach incorporates elements of public health, primary care, and social support service delivery as part of a network linked to the appropriate secondary and tertiary hospital services.¹⁵ This system also includes a set of primary care interventions called Enhanced Primary Healthcare interventions (EnPHC). The interventions consist of 3 pillars: (a) community empowerment and health awareness (Pillar 1), complete with a population health database with population enrolment, as well as risk profiling with targeted messaging; (b) person-centered care bundle (Pillar 2), which consists of the introduction of integrated multidisciplinary care, together with continuous improvement of care delivery and organizational practices; and (c) integrated care network (Pillar 3), which ensures the continuity of care across healthcare facilities and communities, with strategies to improve referral mechanisms between primary health centers and hospitals. These interventions are piloted as primary healthcare centers.¹⁵ The person-centered care bundle first featured the role of the CC. The immediate goal of CC is to ensure coordination, along with the continuity and continuum of care for patients. The end goal of CC is managing the health outcomes of patients as part of the EnPHC intervention. These include early detection of NCD cases, and better management of NCDs. Studies showed that ensuring coordination along with continuity of care (eg, supervising care required by the patient, and monitoring client–patient compliance and care delivery in the clinic) can improve health outcomes.⁹

There is a changing of roles in healthcare professionals as new healthcare delivery models appear and are explored and implemented. With the appearances of a new model of healthcare, there will also be new needs within the health system, which then involve changes in the scope of practice among the health care profession.¹⁶ Hence, with CCs implemented in the primary healthcare setting, there are changes in the healthcare provider scope of practice in order to strengthen coordination of care for chronic disease patients. CC is a new role introduced in the primary healthcare service in Malaysia. Paramedics that served to define the role need to gain credibility and legitimacy for the roles, and finally, transform them into influential roles in the clinic.¹⁷ In this research, we explored and identified factors that can help improve the implementation of an intervention for further expansion.

Methods

Study Design

In this qualitative study, we employed an exploratory approach to identify barriers and facilitators in implementing a new intervention in primary healthcare clinics, and after 10 months of implementation. This was to ensure that any issues during the intervention period could be explored, understood, and later resolved before the intervention is to be widely used.

Settings

A total of 8 clinics involved in EnPHC interventions were featured in this study—4 from Johor, and 4 from Selangor. These clinics matched in their characteristics (eg, type of clinic, population, clinic features). The clinic typically consists of a multi-disciplinary team that includes a family medicine specialist, doctors, paramedics (eg, medical assistants and nurses), support personnel (an allied health officer who is a dietician, physiotherapist, or occupational therapist), laboratory personnel, and an administrative clerk. These clinics serve a range of 200 to 800 patients daily, depending on the type of clinic and location.

Participants and Sampling

We used purposive sampling for this study. The units of analysis were the healthcare providers (HCPs) and the primary CCs (which consist of senior paramedics) at the respective clinics with the EnPHC interventions. The population for the study were all CCs and HCPs in the EnPHC intervention clinics who were present during the interview period. Sample size was determined by data saturation, and interview sessions with HCP were carried out at primary healthcare clinics. All participants approached agreed to be interviewed. All interview sessions took place at their workplace.

Intervention: Care Coordinator

CCs are responsible for patient flow on the day of the patient's visit to the health clinic. Patient flow consists of using a pre-specified checklist to ensure completion of the required pre-visit and visit preparation, generating reports from the registry to identify patients in need of follow-up, and creating contact lists for follow-up work after the patient's visit. CCs also use a visit checklist to trace defaulters (eg, when a patient defaults their medication refill appointment or medical appointment). The visit checklist is a tool for monitoring a patient's status, which must be done prior to their doctor's appointment. This is to ensure all necessary check-ups have been completed, and that the results are available prior to the patient's appointment to help the doctor in the planning of the patient's further treatment. In

the role of tracking the progression of a patient with chronic disease, CCs can improve continuity and coordination of care for better control of chronic diseases. Appointed CCs are among the paramedics in the clinic. In Table 1, a brief overview of roles and responsibilities of care coordinators is presented.¹⁵

Data Collection

The data collection period took place after 10 months into the implementation of the EnPHC intervention (April-July 2018) at a public primary healthcare clinic. Data were derived from 8 in-depth interviews (IDI) with the CC and 8 focus group discussion sessions involving 23 health professionals, 23 paramedics, and 7 support staff. Each focus group discussion session included 6 to 8 participants. IDIs were conducted with 8 appointed CCs from the selected clinic. An IDI with a CC provided feedback from the implementer's perspective; however, we included a focus group discussion with HCPs as part of the assessment process to act as an external perspective to the CC role as part of intervention system. This gives a 360° view of the CC role from the implementer's perspective as well as the parties involved in the intervention. The interview sessions with HCP were carried out in clinics at the participants' comfort and convenience; most interviews were conducted during clinic breaks to ensure that there was no interruption to clinic flow.

The tools used for focus group discussions were a set of semi-structured interview questions derived from consolidated framework for implementation research CFIR, which were designed to help explore the experience and issues encountered with the role of CC. The interview guide consists of probing questions to identify barriers and facilitators faced when implementing the role of CC, and experiences in implementing the practices. We pre-tested the interview guide on participants in one of EnPHC intervention clinic to help identify potential problems that may require adjustments. The interview guides were revised accordingly to include topics such as perception of personal attributes and minimum work experience needed to appoint a CC for future intervention. Interview sessions were conducted face-to-face by research team members who are trained in the qualitative method, and are not close acquaintances with any of the participants to avoid potential response bias.

A participant information sheet and written consent was given to participants before the interviews. Each IDI and focus group discussion was conducted at the clinic in a quiet, secure, and comfortable room. Discussions lasted between 30 to 120 min and were audio-recorded and transcribed verbatim. Field notes were taken by the note taker present in the room for quick reference during analysis. Confidentiality was ensured by removing participants' identifiers from transcripts. The research team cross-checked each transcript through listening to the tapes and reading the field notes.

Table 1. Care Coordinator.

Human resource	Paramedic—nurse or medical assistant Trained in non-communicable disease (NCD) management, integrated pathway care, management, and communication
Objective	To ensure coordination along the continuity and continuum of care
Roles and responsibilities	1. Follow up on clinic attendance and ensure patient information is updated 2. Identify and trace visit defaulter and medication refill defaulters 3. Referral tracking 4. Monitor performance of NCD managements and targets 5. Acts as a bridge between patient and their Family Health Team.
Tools	NCD visit checklist NCD care form

Abbreviation: NCD: non communicable disease.

Analysis

Data analysis in this study was an iterative process where data were transcribed and analyzed after every interview. All audio recordings of interviews were transcribed verbatim by research team members. No translations were done for transcription of interviews in Malay, but coding of data was done in English. In addition, for report and publication, the selected quotes in Malay are translated into English. Excel was used for data management and to facilitate coding of data.

First, we read transcribed interviews to identify preliminary themes independently. Next, meaning units were reviewed, identified, and sorted into first-order coding before being classified into subsequent subgroups of second-order coding. A framework analysis approach guided by the CFIR^{18,19} was carried out, and a codebook was adapted from CFIR's website. CFIR is a conceptual framework that was developed to guide the systematic assessment of multilevel implementation contexts to identify factors that might influence intervention implementation and effectiveness. CFIR is derived from 19 theories about dissemination, innovation, organization change, implementation, knowledge translation, and research uptake. CFIR is composed of 5 major domains with 39 constructs: (a) intervention characteristic, (b) the outer setting, (c) inner setting, (d) characteristics of individuals, and (e) implementation process.¹⁸⁻²⁰ All 5 domains were used for analysis. Coders are members of a process evaluation (PE) research team who are experts in their research (physician, behavioral scientist, health sciences)²¹ and familiar with the CFIR construct. The most representative quotes of each domain were chosen to support results. New emerging themes were arranged and presented based on feedback from participants, and new themes were coded independently from the CFIR and presented accordingly.

Results

Participants in this study included HCPs of various categories, as shown in Table 2. A total of 16 CC and 45 HCP were

Table 2. Participants' Demographic in EnPHC Implementation Study.

Health care providers	No of participant	
	IDI	FGD
Formally appointed care coordinators		
Medical assistant officer	4	4
Registered nurse	4	4
Other health care providers		
Medical doctors		14
Registered nurse		11
Medical assistant officer		4
Pharmacist		9
Others		7

chosen for participation based on availability and category. The constructs and their components from 5 of the CFIR domains are listed in Table 3. These are constructs that the study participants perceived relevant to their work environment. They perceived that the positive constructs like adaptability, leadership engagement and access to information were more likely to help smoothen implementation of the intervention. Whereas, constructs like complexity and availability (lack of) of resources we perceived as stumbling blocks. For this study, we considered the primary healthcare clinic and staff as one organization. We labelled any organization outside the clinic as an external organization.

Identified Barriers and Facilitators to Implementation of Care Coordinator (CC) Based on the Consolidated Framework for Implementation Research (CFIR) Construct and Sub-Construct

Several barriers were identified under the intervention characteristics domain (complexity) and the outer setting of the CFIR framework during the implementation of a CC in the clinic. During a preliminary analysis, patient behavior, such

Table 3. Perception on Implementing Care Coordinator Mapped to Consolidated Framework for Implementation Research Domains.

Domain	Construct	Sub construct	Perception on implementation		
			Facilitates	Barrier	
Intervention characteristic	Intervention source				
	Evidence strength and quality				
	Relative advantage		✓		
	Adaptability		✓		
	Complexity			✓	
	Design quality and packaging		✓	✓	
Inner setting	Cost				
	Structural characteristic				
	Network and communications		✓		
	Culture		✓		
	Implementation climate	Tension for change			
		Compatibility		✓	
		Relative priority			✓
		Incentives and reward			
		Goals and feedback			
		Learning climate		✓	
	Readiness for implementation	Leadership engagement		✓	
Available resources				✓	
Access to knowledge and information			✓		
			✓		
Characteristic of individuals	Knowledge and belief about the implementation		✓		
	Self-efficacy				
	Individual stage of change				
	Individual identification with organization		✓		
Process	Other personnel attributes		✓		
	Planning		✓		
	Engaging	Opinion leaders			
		Formal appointed internal implementer leaders		✓	
		Champions			
		External change agents			
		Key stakeholder			
		Intervention participants			
	Outer setting	Executing			
		Reflecting and evaluating			
Patients' needs and resources				✓	
Cosmopolitanism					
Peer pressure					
	External policies and incentives			✓	

as failing to provide an updated telephone number or next of kin's phone number as a contact number fit into CFIR's *patient need and resources* construct after much deliberation between researchers. Positive perceptions perceived as facilitators during implementation fall under the domains of inner setting, intervention characteristics, implementation process, and characteristics of individuals.

Domain 1: Intervention Characteristics

Four out of 8 constructs for intervention characteristics emerged, with adaptability and relative advantage highlighted as facilitators. Delegation to other HCPs in tracing and tracking patients that defaulted on clinic appointments was one of the changes that was made for intervention to

work in the clinic setting. This alteration was made by executing a method for tracing patients, rather than altering the aim of interventions.

We divide the task. In the clinic, we have divided clinic operationalize service area to zone A and B. We allocate someone in charge of each zone example if there is patient that default (appointment) in zone A, tracing and tracking of the patient will be handle by zone staff A. (Head nurse, 46 years old)

Having a CC in the primary health clinic was considered a facilitator in the relative advantage construct, which consists of monitoring patients' health performance and comparing recent performance to information from the previous visit.

CC zone knows his/her zone performance zone, in terms of diabetic control, whether is it good or not? Then, we can compare it (performance) to each zone, so we know which zone has much defaulter that need to be trace, which zone has glucose result always high, which need to control. . . So, compared to before this, we only know as one clinic performance, as a whole, and then there is a Medical assistant who holds the report, so he knows, but everyone else does not know. (Doctor, 34 years old)

The construct of *Complexity* addresses the complexity of the intervention, not the complexity of the implementation. The CC involves multiple steps and multiple personnel to achieve the objectives of the intervention. Tracing a patient that did not turn up for clinic visits or medication pick up to the tracking of referral appointments involves multiple steps and requires clinic staff participation from all professions. Contacting patients and arranging a new appointment while updating daily checklist can be a burden to the paramedic in the clinic. They perceived this as a barrier of the intervention due to additional tasks on top of their job scope.

(Appointment) defaulters we have to trace, pharmacy medication defaulters we have to trace. We are also tied up with a lot of task and we also need to do all the tracing; this includes getting the contact number, sending reminders to patients, call backs for medication pick up amongst others. (Medical assistant, 37 years old)

The *design quality and packaging* construct refers to how the intervention is bundled, presented, and assembled. A CC is equipped with the tools to monitor the patient investigation, appointments, and referral for chronic disease patients. The NCD visit checklist is an operational management checklist that helps CC keep track of patient care management. It is a tool used by a CC daily to monitor patient visits to the clinic. Before the patient visit, all investigations and referral feedback are traced, and during the patient visit,

the visit checklist is updated. This to help improve consultation and shared decision-making between the medical officer and patient, which facilitates the intervention.

Visit checklist is a good tool, from entering patient visit dates, HbA1c results and written report easily attained. Visit check list is actually good. (Head Nurse, 46 years old)

However, rigorous updating of the visit checklist can be perceived as a barrier because it creates confusion among the CCs in executing their task.

The visit checklist system was not fully developed, so every month there would be continuous changes causes a lot of confusion. (Medical assistant, 36 years old)

Domain 2: Inner Setting

This domain consisted of 5 constructs and 9 sub-constructs centered on organizational context. Several facilitators and barriers were raised within the primary healthcare clinic that covered 4 out of 5 constructs in the domain. Under the construct of *network and communication*, working relation across services and professionals at the clinic was apparent and facilitated the tracing of patients who defaulted on appointments and medication refills.

For us working at Maternal child health unit, we are more to helping; like for tracing defaulters is within our purview because as Nurses would do a lot of home visits. So, when the outpatient department unit informs us of a defaulter, we'll help by visiting the defaulter's home while we do our task; provided they give us the complete address. (Head nurse, 49 years old)

There are opportunities to engage other staff within the clinic in tracing defaulter patients by collaborating with the home visit team and Maternal Child Health team, as they frequently visit patients' homes for care services. This networking and collaboration between clinic staff created a team culture in the clinic. *Culture* as a construct in the inner setting is an essential component within the organization. It influences the effectiveness of implementation. Most of the participants expressed the importance of team culture in the clinic.

For the Pharmacy service, we are the ones calling the defaulters, we are the ones asking why they didn't come to pick up their medication. (Pharmacist, 35 years old)

HCPs expressed that the culture of teamwork is important in the clinic, and helping each other eases the burden of work and strengthens the bond among the clinic staff.

Under the *implementation climate* construct, issues on barriers and facilitators were identified under 3 sub-constructs: compatibility, relative priority, and learning climates.

The *compatibility* sub-construct refers to how the intervention aligns with participants' own norms, values, and how the intervention fits with existing workflow. HCPs acknowledge the tasks of a CC have some similarities of their daily job scope in the clinic.

Actually, Head Nurse job scope does work like that. Monitor movements of clinic, clinical activities . . . so when he (Medical officer in charge) appointed us as a care coordinator, it (the work) is similar. (Head nurse, 46 years old)

Defaulter tracing in Enhance PHC intervention is good. I can see the similarities (task) in Maternal Child Health program. (Head nurse, 46 years old)

They expressed it as an expansion of their own job scope.

However, challenges under the sub-construct *relative priority* were raised, in which CCs expressed their concerns regarding losing their clinical skill due to additional administrative tasks while executing the role of CC. Their job scope has shifted priority to administrative tasks.

We fear of missing out on our clinical skills because as a CC is more administrative—we have to constantly be in contact with our patients, picking up calls, chasing patients who didn't come for their appointments, gathering those who missed their appointments, preparing the necessary documents on a daily basis. I fear losing my clinical skills bit by bit. (Medical assistant, 31 years old)

Under the *learning climate* sub-construct, CCs discussed working together with the clinic staff and medical doctors in charge to solve problems that arise during implementation. Together, they can find a solution to overcome the problem, and some of the HCPs work together with CCs to ease some of CC work burden.

He/She discuss based on our problem, we talk, we find the solution together, find the best solution . . . So, we try the (solution), if it seems to be working then (process) will be smooth. . . Success. (Medical assistant, 33 years old)

The *readiness for implementation* construct is defined as an immediate indicator of an organization's commitment to its decision to implement an intervention. This construct has 3 sub-constructs: leadership engagement, available resources, and access to knowledge and information. *Leadership engagement* and *access to knowledge and information* were raised as facilitators that contribute to an organization's readiness for implementation. Leadership engagement plays an important role in motivation of the staff in the clinic. Paramedics expressed that doctors in charge of the clinic were open to improvement, and would sit with them and discuss a solution for any

clinic problems. This helps find clinic staff together in implementing EnPHC interventions. They feel that they have the support to overcome any challenges in their daily work at the clinic.

I feel my clinic can implement all the interventions because our Medical Officer in Charge is good. Any directives given (from State officer) that need to be implemented, we can implement. (Head nurse, 46 years old)

Information regarding intervention is essential for any intervention to be implemented successfully. Under the sub-construct *access to knowledge and information*, most CCs perceived the position and role of CC as new to the clinic, and expressed that guidance in the position is not available, and that it is difficult to seek advice on CC responsibilities from peers. Therefore, mentor–mentee initiatives from the intervention design team and training session from the state office help paramedics to understand the role, responsibility, and the workflow of a CC.

We were given in house training that was conducted at that time. In the training, he (medical office in charge) explained how the flow of work is in this task. This flow, this task/job, this work process, the responsibilities of CC. (Head nurse, 46 years old)

A CC should go the specific CC training given by Ministry of Health (intervention team). It was a big training session and each time they have updates, we shared information and discussed it with the officer in-charge. (Nurse, 31 years old)

CCs are also supplied the standard operating procedure, which is information in the form of a compact disc, and a mentor contact number if they need guidance in implementing the intervention.

Challenges were raised under the sub-construct *available resources*. The most common constraint was lack of paramedics in the clinic. Therefore, multitasking and shifting roles and responsibilities onto others occurs in the clinic. The turnover of medical doctors is high in some clinics, and in some places is not proportionate relative to the population. Paramedics, although larger in numbers, are involved in clinical activities such as wound dressing, fundoscopic assessment, and emergency response. This causes bottlenecks in certain areas of the service, depending on where they are stationed. Some paramedics stay back after operating hours to complete their visit checklist and conduct defaulter tracing.

We have improvements in numbers of doctors; we used to have 3, now we have 6 doctors Even though most went for courses, we at least have 2 or 3 at any time. But we have a shortage of paramedics when they go for courses. (Head nurse, 46 years old)

Other constraints mentioned were phone line access at the clinic. Each clinic is supplied with 1 phone line, and all units in the clinic must share. Therefore, tracing appointment defaulters is limited to the availability of the phone.

We can only trace those we can do the usual means. Those that we can't we find them through other means—we go to their homes. When we call we use the clinic's phone (landline) and the phone not always in a working condition. (Nurse, 31 years old)

Domain 3: Characteristics of the Individual

This domain consists of 5 sub-constructs. Three out of 5 sub-constructs were found to facilitate the implementation of intervention. In the sub-construct *knowledge and belief*, most participants believed that work experience in a community clinic setting is essential to ensure that the functionality of CC is not impaired by unfamiliarity to the clinic work flow, process, and community. One of CCs voiced that, "One is considered to be appointed as CC, he/she must have a long-standing service at the community clinic, so he/she is very well aware of the clinic flow and process. (Head nurse, 46 years old)

Of equal importance was good communication skills in coordinating care between the population and the health-care provider. CCs expressed that good communication skills with the public are essential. He or she also needs to be interested in, and committed to, community care.

As I said before, 3 years of working experiences may not necessarily be enough. It depends on the person; if 1 year working experiences with a committed attitude, interested in community care, he/she will be good enough. (Medical assistant, 37 years old)

CCs should also be competent in using a computer, as a majority of the tasks require writing and generating reports to the State Health Office and Ministry of Health.

Paramedics working in a clinic and at a hospital are very different. Clinic paramedic involve works more on written (reports) while hospital staff are more clinical; they (hospital paramedics) don't use the computer as much. So, when they are appointed as a CC at the community clinic, they will have problems. (Medical assistant, 37 years old.)

Most paramedics view CC tasks positively. They agreed that the CC is a team leader in coordinating care for patients of the clinic. These findings are supported by the following quote:

CC is actually kind of team leader, he/she managed all. In terms of appointment, patient attendance, defaulter—if patient do not come (to clinic), we have to trace. If there was abnormal result, we have to call the patient to come and blood again. (Medical assistant, 25 years old)

Participants perceived identification with the organization as being related to the degree of commitment to the organization, and expressed a sense of pride, particularly in implementing a task successfully.

I feel the care coordinator is very important, because he/she needs to get things done; he/she needs to brief all staff, conveying the daily expectations and during implementation he/she needs to ensure everything is running well. At the end of the day, the CC needs to wrap up and plan for the next day. (Nurse, 25 years old)

Other personal attributes are required, such as mental strength to overcome challenges while executing CC responsibilities. He or she must be able to embrace change, embrace failures, and deal with difficult people. One of the CCs voiced his observations of CC personal attributes:

He/She must have a strong mentality because we would be facing many challenges; a CC's scope of work varies; not only at the clinic but also involving the community. (Medical assistant, 37 years old)

As far as work experience among CCs, there were mixed views on years of experience required; however, the majority agreed that whoever had experience in a community care setting would be a good candidate for the CC role.

Domain 4: Implementation Process

Under this domain, 2 out of 8 constructs emerged from the analysis that facilitated the implementation of intervention. Under the *formally appointed internal implementation leaders* construct, CCs were appointed from the pool of existing workforce at the clinic with one predetermined characteristic: they must be among senior staff (either a nurse or medical assistant with a long-standing history of working at the clinic).

When I was appointed from the State Office for role of CC. . . I was called for a meeting and was explained what the CC duties were. (Head Nurse, 46 years old)

Individuals who have been formally appointed are responsible for implementing the intervention. Indirectly, that person is given the authority to execute the implementation. This makes it easier for the person to plan strategies for the execution of implementation. Re-organizing resources and work processes in the clinic is one of approaches to accomplish a given task.

Since it (Enhance primary care program) will be at our clinic, manpower and equipment limited, so it's very difficult when we're doing CC task. So, I had to discuss with another CC (in the clinic), we have to rearrange the clinic in terms of secondary triage location, then identify staff to man the

secondary triage, primary triage and also identify who is responsible to manage appointment (TCA) for patients. (Medical assistant, 37 years old)

Domain 5: Outer Setting

This domain has 4 constructs that pertain to factors outside the organization. Two out of the 4 constructs (*patient's needs and resources* and *external policies and incentives*) were noted to create possible barriers. Challenges in contacting patients due to patients not providing current and relevant contact numbers contributes CCs making alterations of their tracing and tracking methods for patients who do not show up for clinic appointments.

Sometimes patient change their phone number, old phone number is not updated, when we ask for patient's phone number, sometimes patient says they don't have a phone. It's common for people here not to have a phone. Sometimes, patients are given phone numbers of their children, when we call, the child did not know that their mother did not come to the clinic. (Medical assistant, 31 years old)

Another barrier perceived by CCs was under the *external policies and incentives* construct. This construct relates to mandates from top management that could influence the implementation of intervention. One of the states in the EnPHC intervention implemented the use of an electronic system. This system (built in-house by the state) was original not State-wide implemented became compulsory for use in EnPHC clinics. The directive to implement came in order to "standardize" the use of an electronic system that was originally a part of the EnPHC intervention, but had yet to materialize. The state have decided to use their own developed system to match many of the characteristics that the EnPHC is trying to implement. The CCs in the clinics are responsible for leading this implementation. They are trained on the electronic system, and are required to train the staff at the clinic. On its own, this task can be monumental, especially if the CC is not technologically savvy and requires some adjustment to fully adapt to the relatively new system.

State office give us directive to use ePRS (electronic system) in October. We start ePRS. Visit checklist is an easy tool for monitoring and easy to generate report. . . We click on report 1, report 2, report 3, all report prepared by using visit checklist system. But the instructions are to use ePRS, we use ePRS. We're in process to adjust. (Head nurse, 46 years old)

Discussion

In this exploratory study, we aimed to identify barriers and facilitators in implementing a new intervention in primary healthcare clinics. Key findings from the study will help

guide policymakers and top management. Findings can also help to improve their upscaling plan for the role of CC to be implemented at all public primary healthcare clinics. From our findings, they are mostly perceived as facilitators that help smooth implementation of the intervention. Inner setting and characteristic of individuals play a role in providing a supporting environment for CCs to implement their role and responsibility. The creation of a new role and tasks using the existing workforce requires time to allow the relegated individual to acclimatize to the role. The process of gaining notoriety is tied closely with time and familiarization to the locality and the task. Team culture, such as team huddles, staff meetings for problem-solving, and information sharing are the key elements that support CCs in doing their job well. Some informal incentives, such as a lunch token, may help motivate clinic staff by initiating healthy team competition; recognition of which team made the most progress or did the best job strengthens team spirit in the clinic.^{22,23} The implementation of this problem-solving method does not necessitate formality and can be useful as a non-formal method. A good relationship with the clinician and clinic leader helps to better support their work.²⁴

Accessibility to information regarding responsibilities and related workflow in the form of job training, and strengthening the mentor-mentee initiatives from the intervention design team and the State Health Office was valued by the paramedics. This mentoring (or supervision) system ensures that progress is continuously monitored. Studies also show that mentoring and coaching help to strengthen and improve clinical practice, as well as the health system.²⁵ This support of knowledge access and an alternative provision of teaching are imperative to ensuring that the implementation of the CC intervention follows the intended plan, and avoiding serious deviations that may hinder the success of the implementation. CC characteristics that emerged from this study pertained to the CC being familiar with the primary healthcare setting, as familiarity with the job may affect the productivity of the work.²⁶ Very few pieces of literature have suggested a minimum duration of experience for a person to be appropriately appointed as a CC. However, in this study, the consensus among the CC was that the person needs to have at least 3 years' experience in community healthcare, good communication skills with the community, mentally prepared to overcome challenges, and be a good team leader.

Barriers or challenges raised were within the intervention characteristic under the constructs of complexity, inner setting (relative priority and available resources), and outer setting.

The current system and resources support current clinic activities. They tend not to support new interventions and their functions¹⁰; for example, regular monitoring of patient health status, health needs, and services requires frequent CC and patient communication. A CC monitors the patient's visit at the clinic, and traces laboratory analyses and

medication defaulters. This task requires many steps and multiple personnel. For future improvement, health technology should be considered for improving our medical record system. It would be beneficial to learn from Taiwan's experience in implementing a national medical record exchange system, which solves problems such as tracing laboratory results, medication prescriptions, appointment visits, and improves continuity in healthcare.²⁷

Concerns were raised in regards to clinical skill loss due to the additional administrative tasks required in the role of CC. The priority in their job scope has shifted to administrative tasks, as opposed to clinical tasks. Paramedics who must juggle their clinical responsibilities and CC tasks may experience stress and burnout episodes. One study showed evidence that an influential team culture may protect health professionals from work-related exhaustion in the clinic.²⁸ Thus the CC requires excellent team support and leadership guidance in implementing a successful intervention.

Available resources need to be addressed for a CC to implement his or her task. Providing the clinic with more than 1 phone line to call patients might ease CC tracing and calling activities. Alternatively, the HCPs should get reimbursed for using their personal phone for tracing patient activities.

Understanding patients' attitudes toward technology and getting them involved in managing chronic conditions will be critical for establishing patient compliance with clinic appointment strategies.²⁹ Patients' attitudes toward health information and technology are split into 3 categories: (a) strongly agree with cell phone and electronic reminders; (b) patients who feels technology is a low priority for health and relies on memory for keeping track of health tasks, and (c) patient agrees that their health will improve if follow-up notices are sent via cell phone, but not electronic reminders. Differences in these attitudes may have implications for health outcomes because these attitudes affect patients' participation in care. Understanding the attitudes may help HCPs to tailor different approaches to engaging their patients in their healthcare.

With the CC being implemented in primary healthcare settings, there will be changes in the paramedic scope of practice in order to strengthen coordination of care for chronic disease patients. New changes (or a reinvention of an existing concept) come with challenges that require time to be adequately implemented with support in the current setting. The current workforce is either working past, or at the highest burden of work. It is hoped that, given time, they will be able to adapt after continuous coaching and feedback from their mentors, as well as their own understanding of the concepts.

Conclusion

The introduction of the CC intervention posed different challenges in different settings. The fact that the implementation of the intervention is flexible and non-standardized

meant some localities faced different levels of challenges. Team support and leadership guidance do help CCs perform their tasks. To further the knowledge of roles and responsibility, accessibility to information and support from top management can further strengthen CCs' confidence in executing their responsibilities. The branding of the CC as an intervention does provide a sense of responsibility, but some perceive it as a burden. Above all, it is seen as a paramount component of the EnPHC intervention.

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Authors' Contributions

ZA, MZJ, ANMH, and INI were responsible for the concept, development and supervision of the research. MZJ, ZA, NAS, and SHAA analyzed the data. MZJ, ANMH, and ZA constructed the draft manuscript. All authors contributed to the writing of the manuscript, reviewing and approving the final manuscript.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Ethics Approval and Consent to Participate

Ethical approval for the Enhance PHC study was obtained from the Medical Research Ethic Committee (MREC) Malaysia (Research registration number: NMRR-17-295-34771). Informed written consent was taken from all respondents prior to interviews.

Consent for Publication

Publication approval was obtained from the Director General of Health Malaysia (Approval no: KKM.NIHSEC.800-4/4/1 Jld. 72(48)). Consent for publication from participants was obtained during consent taking process prior to study.

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Availability of Data and Materials

The dataset that support the findings of this article belongs to the Enhance PHC study. At present, the data are not publicly available but can be obtained from the authors upon reasonable request and with permission from the Director General of Health, Malaysia.

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