

# Understanding the Family Doctor Concept in Public Primary Care Clinics in Malaysia: Objectives, Initiatives, Resources, and Expected Outcomes

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## Research

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# Abstract

## Introduction

Family Doctor Concept (FDC) was a program introduced at selected public primary care clinics to strengthen family practice in Malaysia. It is a healthcare delivery system approach that strives to achieve “One Family, One Doctor” concept so that the physicians can provide the population with comprehensive, continuous, collaborative, personal, family- and community-oriented services.

## Methods and materials

We collected qualitative data collection via semi-structured interviews with stakeholders (Policymakers, healthcare providers, state- and clinic-level implementers). The data were analyzed using thematic analysis according to the Consolidated criteria for Reporting Qualitative Studies (COREQ) guideline for reporting the findings.

## Results

The 16 stakeholders who participated in this research agreed that the FDC is an approach to deliver integrated, personalized, family-centered, and comprehensive care to clients. However, there were other macro-level and longer-term objectives, such as mapping diseases and improving accessibility. FDC components were related to the objectives, and variation in the implementation was expected to suit different settings. Generally, the stakeholders disagreed on the input requirement, but all cited human resources as a significant limiting factor. There were numerous expected outcomes, which could be divided into short-, intermediate-, and long-term.

## Conclusion

FDC consists of several change initiatives in a complex health care system whereby the capacity building of human resources is critical in achieving the desired outcomes. Thus, there is an urgent need for multiple stakeholders to reach common understanding and building a workable roadmap for successful implementation.

## Introduction

Globally, health care systems in many countries are facing numerous challenges on various fronts. One of these challenges stems from the pattern of diseases changing from predominantly communicable diseases to non-communicable diseases (NCDs). This epidemiologic transition has caused a significant rise in the prevalence of NCDs worldwide. In 2012 alone, NCDs contributed to more than two-thirds or 68%, of the world's 56 million deaths, of which 40% were premature deaths in those aged < 70 years (1). An increase in the prevalence of common NCD risk factors, including unhealthy diet, sedentary lifestyle, and obesity were the main contributors to this surge in premature deaths (1).

In Malaysia, the challenges of NCDs are even more palpable. The 2015 National Health and Morbidity Survey (NHMS) reported high overall prevalence of three major NCDs: diabetes mellitus (DM), hypercholesterolemia, and hypertension (HPT) (2). The prevalence of DM increased to 17.5% from 15.2% in 2011; that for hypercholesterolemia increased to 47.7% from 32.6% in 2011, while there was a slight decrease in HPT prevalence to 30.3% from 32.7% in 2009 (2). Moreover, the prevalence of other risk factors, such as overweight, obesity, and abdominal obesity, increased by 0.6%, 2.6%, and 2.0%, respectively, compared to 2011. However, it was most concerning that almost 50% of the respondents were unaware of their raised blood glucose and raised blood pressure (3).

Adding to the burden of NCDs is the aging population. Malaysia is projected to become an aged nation by 2030, where 15% of the population will be aged > 60 years (4). Other than increased NCDs and healthcare expenditure, concerns are rising over how long-term care can be provided to those whose conditions are irreversible. The challenge is finding solutions that preserve the dignity and independence of those who need care by allowing them to remain in the family environment. In Malaysia, the provision of healthcare services is even more complicated because its multi-ethnic, multi-culture, and multi-religion society has different preferences and values.

Recognizing these challenges, the Ministry of Health (MOH) Malaysia has embarked on a reform agenda to transform the current health system delivery. The basis of this transformation is a World Health Organization (WHO) recommendation termed universal health coverage (UHC), which is aimed at ensuring that all people have access to the health services they require and that the services are acceptable and adaptable without imposing financial hardship (5). Experts from various countries believe that the thrust of this reformed health system lies in primary healthcare to deliver more comprehensive and person-centered care (PCC) to the population (6–10). In Malaysia, the role of primary care physicians, who comprise general practitioners (GP) and family medicine specialists (FMS), as the gatekeepers of health, is a general understatement. The primary care physician manages the patient in the context of their family and community while recognizing the broader determinants of health with links to public health (11–13). At the same time, the physician examines the full spectrum of disease,

intervenes early to maintain wellness, and delays the onset of sickness (14–17). Thus, the treatment is not merely curative, but includes preventive treatment as well.

## Family Doctor Concept (FDC)

From this background of health reform agenda, the FDC or “konsep doktor keluarga” approach was proposed in late 2013. It began in 2015 with a pilot project involving 14 primary care clinics run by the MOH across the country and was expected to expand to another 48 clinics yearly. In 2018, a total of 158 public primary care clinics had adopted this approach. This healthcare delivery system approach ensures that the existing family doctor practice in primary care clinics is strengthened in both public and private settings (18). Therefore, the population as an individual or as a family unit should be able to enjoy continuity of care from a family doctor, which is holistic and comprehensive. This healthcare delivery approach is in contrast to doctor hopping, which is a common practice in most primary care practices (19).

The FDC strives for “One Family, One Doctor” so that the physician can provide the whole family with comprehensive services “from the womb to the tomb” (18). In implementing this approach, the population has to be registered or assigned to a primary care clinic, usually near their homes. This strategy allows primary care providers to recognize the population’s characteristics within the operational service area and enables the provision of personalized care (18). However, since the first pilot project in 2013, the approach has not undergone process evaluation. Even though data are regularly sent to the MOH monthly or yearly, they are seldom useful for providing a real picture of the various stakeholders’ implementation processes. Moreover, it does not provide policymakers with valuable data for decision-making.

Besides, as the number of clinics implementing the FDC increases year on year, there is a need to improve the understanding of ground-level healthcare workers, including the objectives, components, and assessment of FDC implementation, and the real picture of what happens on the ground (20, 21). In addition, understanding the planned inputs, activities, and expected outcomes within a particular timeframe allows the development of a logic model for the FDC (22, 23). In MOH settings, information usually flows in a top–down approach hierarchically. In the FDC, federal-level policymakers train the state-level officers responsible for implementing the intervention in selected public primary care clinics in their respective states. The policymakers guide the implementation with a published guideline and conduct serial visits to the pilot clinics (24).

Thus, the present study is aimed at understanding the objectives, initiatives, resources, and expected outcomes of the FDC in public primary care clinics.

## Methods

We used semi-structured interviews to collect information on the FDC from various stakeholders’ perspectives. The areas of discussion covered the origins of the FDC, its components and objectives, inputs, and the processes involved, and the expected outcomes. The reporting followed Consolidated Criteria for Reporting Qualitative Studies (COREQ) guidelines to ensure the good quality of this study (25). The COREQ checklist provides clear and all-inclusive guidance for the reporting of qualitative studies.

## Recruitment of participants

The participants were recruited using purposive sampling. This sampling method is appropriate because it is non-probability sampling, which is most effective when studying a particular aspect in complex interventions with knowledgeable experts (26). We approached several stakeholders in the healthcare system to participate in the study. The stakeholders are federal-level policymakers holding positions such as director, deputy director, and senior principal assistant director (SPAD), as well as state- and clinic-level implementers. State-level implementers are usually public health physicians (PHP). In contrast, clinic-level implementers are FMS or medical officers-in-charge (MOIC). The stakeholders were required to have at least 5 years’ relevant work experience with MOH Malaysia.

The MOIC were selected based on the duration of their involvement in FDC implementation (at least 2 years) and their constant engagement with healthcare workers on the ground (18). To ensure that these MOIC criteria were met, potential participants were recruited from a list of MOIC at clinics involved in the FDC available from the program director at the MOH. A selection criterion of at least 5 years’ experience in Malaysia’s primary healthcare system was imposed to ensure that the stakeholders could describe Malaysia’s primary healthcare system during and before FDC implementation. Then, we estimated the number of participants required for achieving saturation (27). We aimed at obtaining at least 15–20 stakeholders. This estimation was based on at least three representative federal-level policymakers, at least three representative state-level implementers, at least three specialist representatives each from the fields of public health and family medicine, and at least three MOIC. The interviewees were from these healthcare provider groups because the FDC is a relatively new approach and we were interested in exploring their understanding from multiple perspectives.

# Interviews

Figure 1 shows a flowchart of the general overview of the research process. We first developed a conceptual model based on a review of the FDC document at the MOH, meeting minutes, and FDC implementation guidelines. Following a discussion, we developed the topics and list of questions. The interviews were conducted in English and Bahasa Malaysia based on the interviewees' preferences. The interviews were pilot-tested with three MOs to ensure that the topics and list of questions could be understood and were appropriate. Minor adjustments were made to the final list of questions based on the interviewees' feedback, including rephrasing the question on the origin and aims of the FDC to suit the stakeholders' respective levels, and dropping a question on the costs of inputs.

The final list of questions was emailed to the interviewees in advance of the interview to inform them of the general scope of the process (Table 1). MA and AI analyzed the interview recordings and the verbatim transcriptions. Member checking was done by sending the transcripts to the interviewees to establish the credibility of the results. Feedback from the interviewees was welcomed, and follow-up interviews were conducted until the interviewers and interviewees were satisfied that data saturation had been achieved.

Table 1  
The final list of questions for stakeholders according to the topics

Topics	Questions	Probing questions
<b>Objectives of FDC</b>	1. How does the idea of FDC came about in the first place?	1. How was the idea of FDC developed? 2. What is FDC trying to achieve? 3. What sort of problems FDC trying to solve in public primary care clinics?
<b>Initiatives under FDC</b>	1. How FDC was implemented in public primary care clinic?	1. What are the steps taken by various stakeholders for implementation? 2. How do clinics with FDC operated differently from other clinics? 3. What are the processes involved during implementation?
<b>Resources requirement of FDC</b>	1. How much resources required to implement FDC?	1. What form of resources needed for successful implementation? 2. What are the enabling and barriers faced by stakeholders? 3. What kind of training required for the implementation of FDC?
<b>Expected outcomes</b>	1. What are the expectations by implementing FDC?	1. What are the indicators most suitable to measure the success of FDC? 2. How to measure the suggested outcomes or indicators? 3. Any time frame provided to reach the goals or objectives?

## Data analysis

We used deductive or theory-driven thematic analysis to analyze the qualitative data, using the topics as the analysis framework. AI and MAMR conducted the qualitative analysis using NVivo 12 (QSR International 2020) to code the data. The analysis followed six steps, following the guide by Braun and Clarke (28). First, the coders familiarized themselves with the data by compiling the interview transcripts. The coders read the transcripts several times and made preliminary notes about possible relations to the topics. Second, the research team generated initial codes throughout the data. Third, the codes were reviewed for potential themes under the constructs of the topics. Fourth, the research team reviewed the codes to fit within themes and that the themes fit the scope of the topics. This step was vital to ensure consensus among the researchers. MA, AZ, and SS checked saturation according to theme. Fifth, the themes were renamed, defined, and refined. Finally, AI related the themes and codes to the study's aims during manuscript preparation.

## Results

## Participants

During an MOH-organized 3-day workshop session on revising the FDC guidelines, we approached a total of 30 people, all of whom agreed to participate in this research. However, 10 withdrew after receiving the question list because they were not confident about being interviewed, and four were too busy, leaving a final 16 participants. Thus, the interviewees, to a certain extent, are experts in the field and have better knowledge than most stakeholders. The majority of the participants were also involved in FDC pilot projects at national or state level. Table 2 shows the classification of the 16 participants, among whom were federal-level policymakers in the capacity as director, deputy director, or SPAD. The state-level implementers were SPADs, who were also PHP or MOs; at the primary clinic level, the interviewees were FMS and MOIC.

Table 2  
Classification of participants involved in the study

Participants	Gender	Involvement in FDC pilot project	Years on involvement in FDC	Years of service in the MOH
<b>Policymakers at the Federal Level</b>				
Policymaker 1	Female	Yes	3	28
Policymaker 2	Female	Yes	5	25
Policymaker 3	Female	Yes	5	12
<b>Senior Principal Assistant Director (SPAD) at the State Level</b>				
Senior Principal Assistant Director 1	Female	No	3	15
Senior Principal Assistant Director 2	Female	No	2	16
Senior Principal Assistant Director 3	Male	No	2	9
<b>Family Medicine Specialists (FMS) at the Primary Care Clinic Level</b>				
Family Medicine Specialist 1	Female	Yes	5	25
Family Medicine Specialist 2	Male	Yes	5	18
Family Medicine Specialist 3	Female	No	2	30
Family Medicine Specialist 4	Female	Yes	5	20
Family Medicine Specialist 5	Female	Yes	3	18
Family Medicine Specialist 6	Female	Yes	3	22
Family Medicine Specialist 7	Female	Yes	3	17
Family Medicine Specialist 8	Male	Yes	3	25
<b>Medical Officers-In-Charge (MOIC) of Primary Care Clinics</b>				
Medical Officer 1	Male	Yes	4	11
Medical Officer 2	Male	Yes	4	13

## Interviews and analysis of transcripts

Semi-structured interviews were conducted over 3 months from November 2019 to January 2020. All interviews were conducted in person in locations where the participants were at ease. Two interviews were conducted entirely in English, while the remainder were a mix of English and Bahasa Malaysia. On average, the interviews spanned around 30 minutes to 1 hour. The interviews were coded to cover all themes developed sufficiently from the topics, and the 15 themes were grouped to fit the topics (Fig. 2).

### Topic 1: The objectives of the FDC

From the interviews, all participants agreed that the FDC is a healthcare service delivery system approach in public primary care settings that emphasizes the delivery of integrated, personalized, family-centered, and comprehensive care to clients. It is a new approach unique to the Malaysian setting, in which primary care services in public clinics are fragmented and segmented. The fragmentation is due to healthcare workers from various disciplines, such as doctors, nurses, medical assistants, nutritionists, physiotherapists, and pharmacists, being poorly

coordinated and working independently with the clients. Primary care services are also segmented in that there are three main units in the clinic: outpatient, chronic NCD, and maternal and child health (MCH). The NCD unit caters to clients specifically with diabetes and HPT, while the MCH unit caters to pregnant women and to children aged < 5 years. The outpatient unit manages all other clients, such as those with fever, flu, and all other problems. The situation of clients receiving services in the clinic was best described by one participant:

*"The mother who is pregnant will be seen at the maternal and child health unit; the child who is probably 3 to 4 years old also will be seen by the same unit. However, the child who is 7 or 8 or 9 years old or the husband will have to be seen in the outpatient unit. So, it becomes difficult for doctors to deliver patient-centered and family-centered care to their clients. It becomes much more difficult for the patients because they have to take separate numbers for the different units to see different doctors. It will also increase the waiting time for the clients."*(Policymaker 2)

Thus, at the primary care clinic level, the objective of the FDC is to create a system that allows healthcare workers, especially doctors, to deliver integrated, personalized, family-centered, and comprehensive care to clients. In this system, doctors will be able to see clients and their family members as a whole without segmentation.

However, the participants mentioned several FDC objectives at a more macro level and for the longer term. At meso-level and intermediate-term, the objective of the FDC is for healthcare workers in the clinic to be able to map the burden of diseases in the population under the clinic's operational area based on the client data available at the clinic. This strategy can assist health services delivery planning through a targeted approach, in which health programs are conducted based on the population's disease burden. One participant explained that the clinic's operational area is divided into zones to achieve this targeted approach.

*"Actually, with the formation of zones, our strategies are becoming more focused based on my experience. Subsequently, when we analyze the data, we should be able to identify diseases more prevalent in a particular zone. So, whatever health education programs or interventions can be planned based on the mapping. For example, a particular zone was found to have more issues related to the elderly population. So, we can plan programs related to the elderly population in that area."*(FMS 2)

At macro-level and the long-term, the FDC is aimed at increasing the accessibility of healthcare services to the population and thus improve UHC. This objective can be achieved when the whole population in the clinic's operational area is registered to a healthcare facility. Thus, individuals in the population who are not registered to either public or private clinics can be identified and encouraged to visit the clinic for a medical check-up. There is also a need to prepare the clinic for more complete healthcare reform, especially from the financing aspect.

*"Then, there has been a discussion on healthcare financing initiatives that have been going on and on. But, every time any initiative came, we feel that every person must be registered first. Every individual in the population must be registered. So, either they are registered with the GP, or they registered with the.. aa.. public clinic" (Policymaker 1)*

## **Topic 2: The initiatives of the FDC**

All participants agreed that the initiatives of the FDC must be linked to the objectives. The majority of FMS and MOIC mentioned that adjusting client flow was the first step in ensuring integrated, personalized, and family-centered care.

*"The first step I have to study the patient's flow in the clinic. So, the first three months every morning, I will be standing at the front counter to have a look at the types of patients coming, their numbers as well as the defaulters."*(FMS 1)

However, this initiative may confuse the clinic-level implementers because the client's pathway is not well defined in the guideline or by the policymakers. Some of the stakeholders learned to adjust the client flow based on visits to the pilot clinics and tried to adapt them with guidance from the state-level implementers. In contrast, the pilot clinics experimented with their client flow and made adjustments several times to suit their infrastructure and resource availability. After that, the flow was improvised based on client and staff feedback. This is why variation in client pathways is unavoidable in the implementation process. The policymakers considered any variation acceptable as long as it did not deviate from the concept. One policymaker lamented that some of the implementers strove very hard to have the same clients seen by the same doctors every time, which is impossible in the current setting. Furthermore, it imposed more resource constraints on the already resource-deprived clinic.

*"At first, we only knew the theory. When it was piloted at our clinic, we can do anything. We did outreach for the population registry at the initial stage because we were able to do so, when we presented the outcome, they found this may be the best formula. That was why FDC was continued until now."* (FMS 2)

The formation of teams of doctors in a clinic is indispensable for the FDC, ensuring continuity of care. Ideally, in many countries, a family is assigned to a particular GP to receive primary care services. However, in Malaysia, it is impossible to do so due to the lack of human

resources in the public sector. At the same time, those in the private sector work separately under a different system. The best that the public healthcare system can offer is to have one family seen by the same team of doctors at each clinic visit. It is assumed that doctors on the same team are in constant communication with each other to manage their clients.

*"To have a system whereby a family is assigned to a doctor or a general practitioner is ideal but not practical. Due to the limited resources in our public clinic, a team's formation can ensure continuity of care to the patients and their family members. They will be seen only by the same team of doctors. This system might work if the team strives to achieve the same goals and have standardized management of patients." (FMS 3)*

Consequently, the formation of teams of doctors gives rise to the formation of zones and hence, the practice of zoning of the other healthcare professionals in the clinic. The team is now termed the multi-disciplinary team or family health team (FHT). The formation of this team aids the allocation of health programs as well as for monitoring performance.

*"I told them that let's zone all the staff. So, all the staff will be zoned, including the medical assistants, pharmacists, lab technicians and everyone. Why I zoned them? I zoned them is basically to help out in the running of campaigns. So, it is easier for me to allocate when they do outreach for registering the population." (FMS 4)*

*"In my district, we present the clinic's performance according to zones in FDC. For example, zone A, B, C and D. So, it is not like the ordinary performance presentation because we go into the details. We identify the problematic zones. For example, zones in which the HBA1c of diabetic patients were not too good." (FMS 2)*

When the initiatives mentioned were already in place, it was assumed that the development of the population registry would become easier based on the division of labor. The policymakers knew that it would be impossible to register the whole population under the clinic's operational area. So, the best alternative would be to divide the population into zones, and each team in charge of the zone would begin registering clients in phases. Nevertheless, there were problems of information-sharing between the zones to create a broader picture of the whole population in the process.

*"If they have other alternatives, then why not? However, what alternatives do they have now in terms of the feasibility of doing it? So, it is just like you and me handling a big project. It only makes sense when I take a part of it, and you take another part. But, we must put back the parts together and share. It is probably the best option they have. However, they may have forgotten once they have divided themselves. They forgot to put back together." (Policymaker 1)*

### **Topic 3: The resources required for implementing the FDC**

Most stakeholders believed that assistance in the form of human resources, equipment, and upgrading the physical infrastructure would facilitate FDC implementation in the clinic. For example, the staff of one clinic were happy with the FDC because they had suitable infrastructure, but requested additional human resources. The needs are even more pressing in densely populated areas such as Selangor and Kuala Lumpur, where public primary care clinics cannot keep up with the population growth.

*"If we were given more staff, then the infrastructure must be able to accommodate them. For example, even if we were given extra staff for consultation or registering the population, we do not have enough space to put them. The equipment also includes computers to register all that." (SPAD 1)*

However, it does not mean that the FDC cannot be implemented successfully without material assistance. Currently, other than the pilot clinics at national level, the other clinics are expected to use existing resources for the implementation, with some modifications. One participant mentioned that the FDC is a system and thus does not require many resources.

*"No extra resources. We were using existing resources all the while. For me, the best if we can get all the assistance, but it does not mean that without assistance, we cannot do it. For me, I have to work only with my clinic's staff. But actually, the resources are there, but the system is not in place. That's all." (FMS 1)*

Moreover, the policymakers explained that they did not intend to duplicate services. For example, there is no need to have three separate injection rooms, three ultrasound machines, or three registration counters in the presence of three teams or zones; they can share the same space and equipment. Thus, generally, the need for extra resources in implementing the FDC is minimal. The FDC is not meant to create clinics within a clinic, as understood by some of the implementers.

All stakeholders also highlighted the most labor-intensive activity in implementing the FDC: entering the client or population data into the system. It is especially frustrating when the MOH continually changes the data entry system to be used, and all such systems are unstable.

There have been instances when staff were required to enter data from the same client several times because it disappears from the database. Even if a stable system were available, the MOH is always developing a new IT system in which data migration from the previous system is not possible.

*“Actually, our staff in the clinic are very good. Although the resources are limited, they still do the population registry. But if I’m going to start fresh, I want the MOH to confirm the system first. That is the challenge. In terms of resources, who will enter the data?” (FMS 3)*

*“Even though there is a stable system mentioned by Dr. N, I’m a bit worried when he wanted to introduce it to the clinics. What happened when we have already entered all the data into his system, and suddenly, the clinics were asked to use a new IT system, Tele-Primary Care Oral Health Clinical Information System (TPC OHCIS)? Who wants to be responsible when the data cannot be transferred, and they have to enter the data again?”(SPAD 2)*

Nevertheless, all clinic stakeholders agreed that staff and clients are the essential assets in FDC implementation. Their involvement is crucial because the FDC is a change to the system that has existed for many years in the clinic. Thus, regular staff engagement involving various disciplines in the form of serial meetings can help them understand the FDC and support the initiative. Without their support and commitment, FDC implementation will fail from the very beginning. For this purpose, a clear and standardized guideline may be helpful. For example, doctors in particular need to invest a significant amount of time for training in client integrated management. This training is required because some doctors may not be very well equipped to manage some types of patients due to service segmentation. Equally, educating clients on the new system is essential for avoiding complaints. Most pilot clinics experienced this at the initial stage, but the complaints subsequently turned into compliments.

*“So, the first step is for trying to make sure everybody is on the same level of understanding and try to make a better guideline in term of better implementation at the ground.” (Policymaker 3)*

*“We appreciate FDC a lot because everybody is multitasking, and it is good not only for us in the clinic but actually good for them as well. And the teamwork. Definitely, there is much unity in terms of teamwork. Of course, everybody is not happy at the initial stages because they take time to get adjusted. However, after a year or two, the majority of them are happy with FDC.” (FMS 4)*

## **Topic 4: The expected outcomes of FDC implementation**

The expected outcomes were divided into short-, intermediate-, and long-term outcomes. The short-term outcomes usually take 1 or 2 years to achieve, while the intermediate-term outcomes may take 3–5 years. Meanwhile, the long-term outcomes may take > 5 years. Some participants believed that implementing the FDC would reduce client waiting times for receiving healthcare services in the clinic in the short-term. As mentioned earlier, the integrated system, where doctors see clients together as a family, contributes to the reduction in waiting time. The other contributing factor is the enhancement in care continuity, resulting in a better patient–doctor relationship. The consultation time can be shortened when the doctor already knows the client’s history or past problems. Moreover, a good patient–doctor relationship is expected to reduce mismanagement and medication errors, reduce appointment defaulters, and increase health screening.

*“The first is we can create a good relationship between the doctor and the patient. Secondly, we can reduce the waiting time because when the doctor does not know the patient, they will take a longer time to read the clinic’s card and identify the problems. So, when the doctor knows the patient, they already knew the blood pressure and sugar patterns all this while. So, straight away, the doctor can initiate appropriate treatment. It can also reduce mismanagement and medication errors especially when patients have allergies to a particular medication”(SPAD 2)*

For the intermediate-term outcomes, most clinicians suggested that the FDC can improve clinical outcomes. They frequently mentioned the improvement in the HbA1c levels of diabetic patients and better control of blood pressure in patients with HPT. In terms of MCH, they also discussed certain improvements in national indicators such as anemia in pregnancy, high-risk pregnancy, and under-5 mortality. However, measuring these outcomes is possible only if the clinic’s data analysis is performed and divided according to zones. All of the pilot clinics performed this step so that they could compare the performance between zones. Thus, the staff from each zone will have ownership of their clients and are held accountable for their management.

*“We have to compare between the zones. We have five zones. A, B, C, D and E. Then, the full mark we give is 5. If zone A is the better one depending on the FDC core team, we give a full mark. The idea is that we want them to be competitive. We want them actually to have ownership and accountability. This method can also be a tool to monitor performance.”(FMS 2)*

For the long-term outcomes, the FDC can increase accessibility to healthcare services. For example, the development of a population registry should help healthcare providers identify individuals at risk who are never in contact with the healthcare system. Such individuals should be

encouraged to seek treatment early, and nearby primary care clinics will be assigned to care for them. All stakeholders expressed their disappointment when the FDC was used as an excuse to deny services to clients or to refuse clients from other zones. In general, active screening, early treatment, and optimum quality of care can reduce the morbidity and mortality caused by illnesses, especially NCDs.

*“FDC approach is to register the population. The registering of the population is not merely going from house to house to get their names, but it means to say to them in a welcoming way: “Please come to our clinic, we are registering you. We want to tell you that you are in zone B. Anytime you come to the clinic, there are these doctors with you. They are in this team.” (Policymaker 2)*

Table 3 shows the relationship between the objectives, initiatives, resources, and expected outcomes of the FDC.

Table 3  
The relationship between the objectives, initiatives, resources and the expected outcomes of FDC

Resources	Objectives	Initiatives	Expected outcomes
1. A clear and standardized guideline. 2. Staff time and training. 3. Clients' education. 4. Infrastructure. 5. Equipment.	<b>Micro-level</b> 1. To create a system allowing the healthcare workers, especially the doctors, to deliver integrated, personalized, family-centered and comprehensive care to the clients.	1. Adjustment of clients' flow in the clinic so that doctors can provide integrated management to them.	<b>Short-term:</b> 1. Reduce waiting time. 2. Improvement in the client-doctor relationship. 3. Reduce mismanagement and medication errors. 4. Reduce appointment defaulters.
6. Manpower. 7. A stable registration system.	<b>Meso-level</b> 2. To map the burden of diseases of the population under the clinic's operational area based on the clients' data available in the clinic.	2. The formation of a multi-disciplinary healthcare team consisting of doctors, nurses, medical assistants and staff from other services. 3. The analysis of data and performance appraisal according to the teams or zones.	5. Increase in health screening. <b>Intermediate-term</b> 1. Better control of hba1c in diabetes. 2. Better blood pressure control of hypertension. 3. Reduction in anemia in pregnancy, under-five mortality and high-risk pregnancy.
	<b>Macro-level</b> 3. To increase the accessibility of healthcare services to the population and improve universal health coverage (UHC).	4. The development of the population registry for individuals under the clinic's operational area.	<b>Long-term</b> 1. Improve the accessibility of healthcare services in the population. 2. Reduce the overall mortality and morbidity due to illnesses, especially NCDs.

## Discussion

Our findings of suggested that the FDC is not as simple as it appears as it involves various initiatives at multiple levels. It is “complex” in that the program has many interactions between the components, requiring behavior changes by the people receiving or delivering the services and with variable expected outcomes by different stakeholders (29, 30). It is also context-sensitive because clinics operating in different settings and external environments are expected to implement the concept based on their interpretation (31, 32). Even though there is a guideline for implementation, it does not take into account the various contexts. Various researchers have found that context is vital for most interventions or initiatives in healthcare and health (33–35).

The complexity of the FDC begins with identifying the objectives. The policymakers, who tend to see the bigger picture of an initiative, saw it as a vehicle for achieving a much larger objective. However, the state-level implementers, who are responsible for various health programs and services, perceived it as a means of allocating resources and helping to achieve specific indicators. In contrast, the clinic-level implementers, who interact with clients daily, saw it as an opportunity to deliver more personalized, integrated, continuous, and comprehensive care to clients. Multiple levels of objectives often result when details are lacking on how an intervention can achieve specific effects, usually represented using logic models (36, 37). As a result, stakeholders with different roles and responsibilities emphasize certain activities to achieve specific objectives based on their own perspectives.

The variation in the stakeholders' perspectives on the objectives influenced their perception of the resources or inputs required for implementing the FDC. Generally, any new initiative or intervention might require input in the form of human resources, finances, medical equipment, infrastructure upgrade, and many others (38). However, the critical resources of the FDC are the development of human resources, where trained doctors and commitment from other healthcare workers in the organization are essential for implementing the initiative. Many studies have also shown the importance of leadership and their commitment as the critical success factor of health programs, especially new ones (39–41). Client input in the form of engagement and education are also equally important, but are often neglected in the process. This is expected in a healthcare system where shared decision-making is still in the early phase (42). Involving clients in the development and implementation of the FDC could have prepared them for the change and minimized complaints.

Overall, the components of the FDC were meant to embed three core values shared by the objectives perceived by stakeholders, namely: (1) Personal relationship between client and provider by knowing the client, (2) Communication of relevant information between providers, and (3) Cooperation between providers within and between healthcare settings (43). Even though all participants unanimously agreed on the components, the processes involved and implementation methods may vary. Variation exists in different settings because there is no one-size-fits-all or one model for health intervention (44). Thus, in applying health concepts and interventions, differences in the contexts, populations, and even times must be taken into consideration (45–47). Here, the stakeholders' failure to mention this variation and to provide accepted standardized models might have muddled the implementation. Some of the clinics implemented FDC models that deviated significantly from the policymakers' expectations, resulting in unintended negative consequences.

For an initiative that did not receive many resources, the FDC was expected to achieve numerous outcomes in the short-, intermediate-, and long-term. Reducing waiting times was the primary concern for stakeholders in the short-term because several studies have shown that increased waiting times reduce customer satisfaction (48–50). Local studies have also shown that clients are not satisfied with the waiting time to see doctors in public primary care clinics (51, 52). The much-publicized long waiting times and overcrowding in public facilities may have been the reasons for the lower outpatient healthcare services utilization (8.1%) in 2019 as compared to 12.6% in 2011 and 9.0% in 2015 (53). For the intermediate-term, improved clinical outcomes are mainly attributed to better patient–doctor relationship and communication. It can also reduce healthcare costs (54).

Nevertheless, in the long-term and larger scheme of things, most stakeholders believed that the FDC may pave the way for more wholesome, system-wise healthcare reform to integrate both the public and private sectors. In Malaysia, the involvement of the private sector is significant, in which 40% of outpatient visits are at private facilities, 70% of which are in primary care settings (55, 56). As of 2014, there were 6,978 private primary care clinics in Malaysia, although they were more concentrated in the urban areas and were more accessible to the population. The financing reform aspects are underway albeit at a slower pace (57), but an informal partnership at the healthcare service delivery level can be established at the clinic level. Collaboration between public and private clinics would be in the population's best interest. Public–private partnership in primary health care provides some benefits for increasing accessibility, stimulating the economy, and improving the quality of care (58).

## Strengths and limitations

To the best of our knowledge, this is the first study exploring the FDC from the perspective of stakeholders at multiple levels. The strength of the study lies in the semi-structured interviews with stakeholders who have been involved with the FDC since its inception. This method allows the exploration of detailed information on the interviewee's personal feelings, perceptions, and opinions away from the influence of other group members. Furthermore, any ambiguous answers can be clarified during the interviews, and incomplete answers can be followed-up almost immediately. During the data compilation and analysis, we took numerous steps to guarantee good research practice. One limitation of our study is the lack of involvement of staff other than doctors. This limitation resulted in a lack of detailed description of the implementation processes at the clinic level, which should be addressed in further studies. Future studies should also focus on enablers and barriers to implementation in different contexts and possible improvement of the FDC.

## Conclusion

In conclusion, the FDC consists of several change initiatives in a complex health care system designed to strengthen family practice in public primary care clinics. It incorporates a continuous, integrated, and personalized healthcare delivery system that is more responsive to clients' feedback. Our findings revealed that the capacity building of human resources is critical in achieving the desired outcomes. Thus, a common understanding among stakeholders in building a workable roadmap is crucial for its successful implementation. The importance of this intervention is evidenced by the stakeholders' high expectations and the multitude of outcomes expected from it.

## Abbreviations

COREQ: Consolidated criteria for reporting qualitative studies; DM: Diabetes mellitus; FDC: Family doctor concept; FHT: Family health team; FMS: Family medicine specialist; GP: General practitioners; HPT: Hypertension; MCH: Maternal child health; MO: Medical officer; MOH: Ministry of Health; MOIC: Medical officer-in-charge; NCD: Non-communicable diseases; PCC: Person-centered care; PHP: Public health physicians; SPAD: Senior principal assistant director; UHC: Universal Health Coverage; WHO: World Health Organization;

## Declarations

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## Author Contributions

## Conceptualization

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Project administration: AI, MAMR

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Writing – review & editing: AI, MAMR, SS, TPZTB, NMS, NHN

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## Availability of data and materials

The datasets generated and/or analysed during the current study are not publicly available due to privacy provisions but are available from the corresponding author on approval from the authorizing ethics committee.

## Ethical approval and consent to participate

Before the interviews, all participants were asked to sign a written informed consent. All participants were aware/understood that their participation was voluntary and free to withdraw from the study at any time. All participants also agreed to review the verbatim transcript of their interview. The study also obtained approval from the National University of Malaysia ethical review board (Code: UKM/PPI/111/8/JEP-

2019-584) and MOH Research and Ethics Committee (MREC), Ministry of Health Malaysia (Code: NMRR-18-3871-44034) before the interviews.

## Consent for publication

The consent for publication was obtained from the Director-General of Health, Ministry of Health, Malaysia.

## Conflicting interest

No potential conflict of interest reported by the authors.

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## Figures

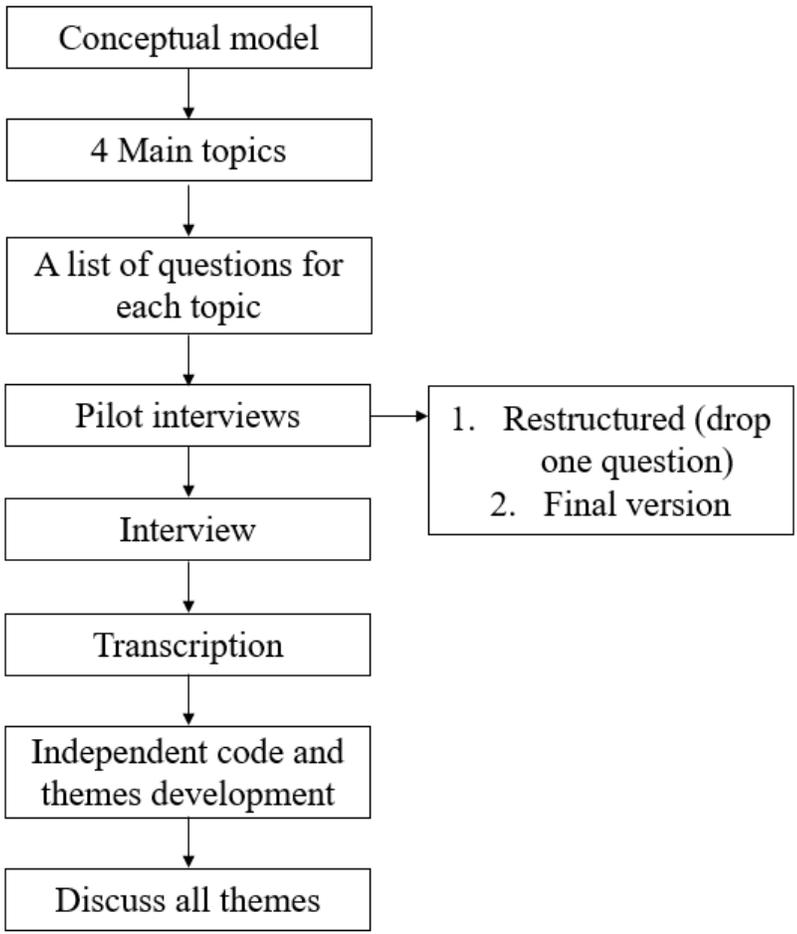
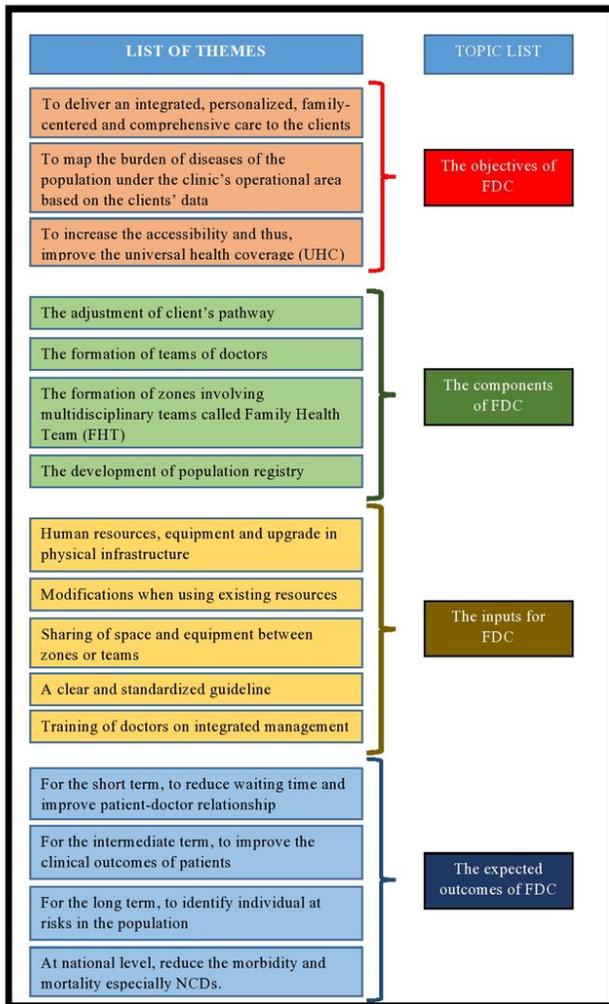


Figure 1

Research process



**Figure 2**

Clustering the themes